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ABSTRACT

The goal of the teacher/university education component of the Peace Corps Liberia Education Training Program is to provide trainees with experiential and theoretical learnings that would be useful to them as inservice teacher trainers or university educators for the Ministry of Education, Republic of Liberia. To achieve this goal, training focuses on: (1) acquainting and familiarizing trainees with Liberia-specific information about roles, functions, and organizational structures; (2) instruction in generic teacher training, providing a cursory treatment of several teaching-learning models and approaches to the supervision of inservice and preservice teachers; (3) instruction in cognitive learning theory, emphasizing that cognitive styles are "culture bound" and that the recognition of differences in learning styles is essential to the adaptation and development of curriculum materials; and (4) instruction in workshop planning, implementation, and evaluation. Multiple handouts provided to the volunteers are present in this report. Included are: "The Revised National Curriculum for Monrovia," "Liberia in Language Arts (grades 4-6)," proceedings from mathematics and science workshops on how certain teachers tackled difficult subjects and students, a training syllabus for the workshop for mathematics and science teachers, a section on volunteer-made materials, and a section on using indigenous materials in the classroom. (JM)

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ED228208

FINAL REPORT

PEACE CORPS STATESIDE TEACHER TRAINING FOR VOLUNTEERS IN LIBERIA

VOLUME II: TRAINING PROGRAM FOR TEACHER TRAINERS (GROUP A)

BEST COPY AVAILABLE

PSI Associates, Inc.
1900 L Street, N.W.
Suite 301
Washington, DC 20036

CONTRACT NO. 82-042-1003

FEBRUARY 12, 1982

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FINAL REPORT

GROUP A: TEACHER TRAINING/UNIVERSITY EDUCATION PCT'S

Mrs. Marilyn Lashely

Introduction

The goal of the teacher training/university education component of the Peace Corps Liberia Education Training Program was to provide trainees with experiential and theoretical learnings that would be useful to them in the role of in-service teacher trainers or university educators for the Ministry of Education, Republic of Liberia.

To achieve this goal, the training focused on:

1. Acquainting and familiarizing the trainees with Liberia specific information about the roles, the functions, and the organizational structures.

2. Instruction in generic teacher training providing a cursory treatment of several teaching-learning models and approaches to the supervision of in-service and pre-service teachers.

3. Instruction in cognitive learning theory emphasizing that cognitive styles are "culture bound" and that the recognition of differences in learning styles is essential to the adaptation and development of curriculum materials.

4. Instruction in workshop planning, implementation, and evaluation.

UNIVERSITY OF THE DISTRICT OF COLUMBIA

READING DEPARTMENT

EVALUTION January, 1982

ACTIVITIES	THEORY	PRACTICUM	DATE OB- SERVED EVALUATION
Word Puzzle - Game			
Study Guide			
Group Participation			
Language Experience A-proach			
Writing Objectives			
Quizzes			
Reading Process			
Materials Analysis			
Readability Formuli			
Sustained Silent Reading			
Functional Reading			
Cloze Procedure			
Understanding the Learner			
Diagnosis			
Use of Questioning			
Usage of English Language (Written and Oral			
Human Relation Skills			
Contracting			
Other			

PEACE CORPS TRAINING

WEEK I (Daily Schedule)

Monday, January 11, 1982

9:00 - 10:00 Registration Introductions

Coffee Break

10:15-12:00 Pretest

12:00 - 1:00 Lunch/

1:00 - 3:00 Reading is a Thinking Process
The Multifacited Reading Process
Understanding the Learner
Diagnosis

Tuesday, January 12, 1982

9:00 - 10:00 Review - Practice diagnosis
Notebook Due with dividers (Final Product) 80%
10:00 - 12:00 Meeting with Participants - Contracting
Materials Analysis
Readability
12:00 - 1:00 Lunch

1:00 - 3:00 continued

Wednesday, January 14, 1982

9:00 - 10:00 Reading Planning and Strategies
Incorporating reading skills into content material

Coffee Break

10:15 - 12:00 noon

12:00 - 1:00 Lunch

1:00 - 3:00 Strategies (See Evaluation Sheeet) Individualized Instruction will be provided to ascertain that ecah participant acquires skills in his contract.

Thursday, January 15, 1982

continuation

WEEK II

January 18 - 22

Practicum will be held in a local junior high school. It is anticipated that each participant will be assigned a minimum of one student to assess and prescribe for. This will take place in a mini school under Dr. Smith's supervision. We will also solicit the assistant of other reading specialists in the building. Trainees will be expected to demonstrate theory learned during week one.
Provisions will be made for observation.

Teacher trainers will in addition give a workshop for each of our participants. All materials will be provided for the workshops.

Teacher trainers will also have the opportunity to work in the reading labs.

Practicum should take place in the morning and planning will take place each p.m.

DAILY LESSON PLAN

Name ______________________ Week of ____________________ Teacher ______________________

Date ____________________

Instructional Objectives	*Materials	Instructional Strategies	Pupil Activities	Evaluation after the lesson is taught

*Directed Reading, Seatwork, Experience Stories, Fun Reading.

UNIVERSITY OF THE DISTRICT OF COLUMBIA

GUIDE TO PLANNING FOR ONE ACTIVITY

Date____________________

Grade___________________

Title (specific, to identify the activity)

Approximate Time____________

I. Instructional objective
What is to be taught. You should be able to measure the accomplishment of the instructional purpose, at the conclusion of the lesson.

II. Materials (if they need to be planned for ahead of time)

III. Procedures (sequential steps of action)

A.	Initiation or Motivation or Stimulation	Should draw from previous experiences of children in or outside of school
B.	Steps in Sequence	Should include mechanics and organization, directions, major ideas, facts and concepts to be developed.

1. Ask children ......etc.
2. Show pictures ......etc.

IV. Summary (from Children)
Should include what was done or accomplished in terms of the instructional objective.

V. Evaluation (from children)
Should include how well activity was done and suggestions for improvement.

VI. Follow-Up or Projection (may or may not be a definite assignment, depending on the nature of the activity)

VII. References

ACTION VERBS

COGNITIVE

Knowledge

checks
defines
describes
identifies
labels
lists
matches
names
outlines
reproduces
selects
states

Comprehension

converts
defends
determines
distinguishes
equates
estimates
explains
extends
generalizes
gives examples
infers
paraphrases
predicts
rewrites
summarizes
translates

Application

finds a way
foresees
interpolates
interprets
manipulates
modifies
operates
predicts
prepares
produces
programs
relates
schedules
shows
solves
uses

Analysis

breaks down
classifies
diagrams
differentiates
discriminates
distinguishes
divides
identifies
illustrates
infers
outlines
points out
relates
selects
separates
subdivides

generates
groups
indexes
invents
modifies
organizes
plans
prescribes
projects
ranks
rearranges
reconstructs
relates
reorganizes
revises
rewrites
summarizes
tells
writes

Evaluation

appraises
compares
concludes
contrasts
corrects
criticizes
describes
diagnosis
discriminates
explains
justifies
interprets

AFFECTIVE

Receiving

asks
chooses
describes
follows
gives
holds
identifies
locates
names
points to
selects
sits erect
specifies
replies
uses

Responding

answers
assists
compiles
conforms
discusses
greets
helps
labels
performs
practices
presents
reads
recites
reports

justifies
proposes
reads
reports
selects
screens
shares
studies
surveys
works

Organization

adheres
alters
arranges
combines
compares
completes
defends
explains
generalizes
identifies
integrates
modifies
orders
organizes
prepares
relates
synthesizes

Characterization

acts

Assignment For Field Placement

(Arranged By: UDC Office of Field Placement)

Period: Monday, January 18, 1982 through Friday, January 22, 1982

All field placements are in the D.C. Public Schools in traditional classroom settings:

Area	Placement
Basic Adult Education	Adult Education Demonstration Center Franklin Center 13th and K Streets, N.W.
Math and Science Education	Ballou High School and Mann Elementary School Program Demonstration Science Program
Reading and Language Arts	Rabaut Jr. High School
Art Education (Industrial)	Penn Vocational Center
Drafting	Woodson High School
Electrical/Auto Mechanics	Phelps Vocational High School
Home Economics and Health Education	Burdick High School
Agriculture Education	U.S.D.A. Experimental Station and Phelps Vocational High School
Radio Communications Education/Evaluation	WYCB - AM Radio National Press Building

University of the
District of Columbia

COLLEGE OF EDUCATION AND HUMAN ECOLOGY
1100 HARVARD STREET, N.W.,
WASHINGTON, D.C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

Dear Co-Worker,

The University of the District of Columbia is very grateful that you have indicated your willingness to guide one of the Peace Corps Volunteers during this semester.

This letter introduces ______________________________ who

has been assigned to work with you from ____________________ to ____________________.
Date Date

The College Supervisor will have a meeting with cooperating teachers and will look forward to seeing you at that time.

We are giving you some copies of materials, and we hope that these materials and conferences with the students will be helpful in interpreting the program and it's goals.

We hope that each student will be able to participate in a small way from the first day in your classroom. Gradually he/she should be able to increase his/her responsibilities.

We appreciate this opportunity to be associated with you in such a vitally important professional endeavor. We shall try to do everything possible to insure maximum results from the time and effort put into this program. We know that you will do the same. If any problems arise please do not hesitate to get in touch with your student's supervisor or with me. The office phone numbers are 673-7049 or 673-7050.

Thank you again, and best wishes.

Sincerely yours,

Miriam C. Everette
Miriam C. Everette
Director of Student Teaching

UNIVERSITY OF THE DISTRICT OF COLUMBIA
GEORGIA AVENUE HARVARD STREET CAMPUS
1100 HARVARD STREET, N. W.
WASHINGTON, D. C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

The Seven Components of An Instructional Activity

1. Initiating The Class

2. Stating The Behavioral Objective

3. Recalling The Immediate Prerequisites

4. Reviewing Home Study Assignments

5. Introducing New Information

6. Providing Practice and Feedback

7. Closing The Class

TABLE ONE

CHARACTERISTICS AND PROPERTIES OF COMPONENT ONE OF A CBC INSTRUCTIONAL ACTIVITY

COMPONENT	PROPERTIES	CHARATERISTICS
1. Initiating the class	1. A. Regular Pattern	1.A. Pose a problem or puzzle
	B. Variation Which Pattern	B. Explain how an activity relates to gaining a new competency
	C. Draws Learner Focus to Teacher	C. Have students recite or perform some action in unison
		D. Present an interesting or unusual fact
		E. Offer an analogy using previously leanred material
		F. Ask for recognition of familiar materials

TABLE TWO

Summaries the characteristics and properties associated with component two of a CBC instructional activity.

Characteristics and Properties of Component two of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
. Stating the Informal Behavioral Objective	2. A. Present the objective in Words appropriate to the student Audience	2. A. Write a Statement - the Informal Behavioral Objective at the beginning of the class
	B. Present the objective in Writing (e.g. chalkboard, overhead, slide, or bulletin board)	
	C. State the objective in words	
	D. Have Two or Three students in Class Restate the Objective in their own Words	

TABLE THREE

Summaries the characteristics and properties associated with component three at a CBC instructional activity.

Characteristics and Properties of Component Three of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
3. Recalling the Immediate Prerequisites	3. A. Recall Needed Prerequisites for Mediation	A. Review previous classes
	B. Select Prerequisites Competencies from Learning Sequence	B. Show parts of media used to present information originally
		C. Summarize the competencies needed
		D. Recall with assessment tasks already used for testing
		E. Review from printed materials

TABLE FOUR

Characteristics and Properties of Component Four of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
4. Reviewing the study Assignment	4. A. Review Home Study Work Immediately	4. A. Student correct errors
	B. Use Home Study as Teaching Not Testing	B. Exchange papers
	C. Provide Positive Feedback for students Effort	C. Students explain tasks

TABLE FIVE

Characteristics and Properties of Component Five of A CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
5. Introducing New Information	5. A. Organize the information by presenting the concept of principle and then illustrations of it; or present examples and require students to create the concept or principle	5. A. Lecture B. Socratic Narrative C. Media Presentation D. Written Passage E. Stimulation
	B. Define all new terms	F. Laboratory
	C. Offer clear concise examples	G. Practical H. Teacher Demonstration
	D. Provide for an active learner role whenever possible	I. Teacher Explanation
	E. Provide appropriate visual or oral clues or other memory aids	

TABLE SIX

Summarizes the characteristics and properties associated with component six of a CBC instructional activity.

Characteristics and Properties of Component Six of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
6. Providing Practice	6. A. Space practice over several trials	6. A. Teacher or written materials directs activity
	B. High ability students will probably need less practice that other students	B. Include only pertinent information
	C. Design practice to move from easy to difficult items	C. Provide detailed guidance
	D. Provide real problems whenever possible	D. Provide positive feedback for all efforts
	E. Very the problem settings	E. Organize for memorization of patterns with mnemonics
	F. Offer individual positive feedback	F. Offer wide range of problem types
	G. Self Assessment	G. Provide real settings and actual conditions whenever possible

TABLE SEVEN

Summarizes the characteristics and properties associated with component seven of a CBC instructional activity.

Characteristics and Properties of Component seven of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
7. Closing	7. A. Summary	7. A. Summarize the activity
	B. Clarify Home study Assignment	B. Assign Home Study
	C. Assessment	C. Students Restate Home Study Assignment

COMPONENT	PROPERTIES	CHARACTERISTICS
		7. D. Administer Assessment Tasks

There are several general characteristics which apply to all instructional activities: (1) attempt to involve the student as an active learner whenever possible, (2) engage the learner in at least two (2) different responding modes for each instructional activity, (3) a minimum of two (2) different instructional activities are required to maximize the number of students acquiring a given behavior or competency, (4) the pattern of student responding modes should be difficult for the two (2) required instructional activities. Table Eight summarizes the various organizational formats of instructional activities and the student responding modes usually present.

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GEORGIA AVENUE HARVARD STREET CAMPUS
1100 HARVARD STREET, N. W.
WASHINGTON, D. C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

TABLE EIGHT

Organizational Format for Instructional Activities and Student Responding Modes.

FORMAT	DESCRIPTION	STUDENT RESPONDING MODE
Lecture	1. Talk by a single speaker to a group.	1. Writing notes and listening
Lecture with Questions	2. A talk by a single speaker to a group. Questions by lecturer and by students.	2. Writing notes, listening, questinging, and responding
Student Demonstration	3. Student actually goes through porcedures as they are really conducted.	3. Writing notes and listening
Practiced Exercise or Laboratory	4. Students practice under conditions of minimum guidance in a real setting	4. Perform task, write steps, findings, and conclusions, and directions
Seminar	5. Group discussion of topic with extensive prior preparation	5. Listening, questions, reading or viewing for preparation
Case Study or Incident Study	6. Group analysis of preselected case history under the direction of an experienced discussion leader	6. Reading or viewing for preparation, writing notes, questioning, listening
Site Visits	7. Students go to actual site of operation, direct observation of place and procedures	7. Observing, listening, asking
Simulation	8. Real incident or event is acted out, real conditions are reconstructed to approximate actual setting.	8. Observing, analyzing, questioning, protected experience with no penalty for mistakes

Writen Passages	9. Textbooks, Journals, Manuals, and other printed materials examined	9. Reading, Note taking
Media	10. Information presented on film, slide/tape, filmstrips, video cassettes, or other media	10. Viewing, note taking, listening
Small Group	11. Limited number of students trying to resolve a given problem with little or no teacher assistance.	11. Discussion, writing, observing
Conference	12. Discussion by group members group comes to some conclusion about original problem	12. Reading, questioning, listening

EXIT COMPETENCIES FOR STUDENT TEACHERS

Student teacher____________________________ School____________________

Subject______________________________ Grade Level______________________

Observed by:____

DIRECTIONS: The student teacher will be appraised from 1 to 5 under each area under management performance and instructional performance. A rating of 1 means Outstanding; 2 means Very Good; 3 means Satisfactory; 4 means Conditional; and 5 means Unsatisfactory.

	Date: ______ Time: ______ Initial Appraisal	Date: ______ Time: ______ Mid-Point Appraisal	Date: ______ Time: ______ Final Appraisal
A. Management Performance			
1. The appraisee will demonstrate the ability to communicate with students.....			
• Praises and encourages students' actions			
• Accepts and uses students; ideas clarifies, builds, and develops			
• Communicates with students in terms they can understand			
• Develops students' understanding of the needs of various roles, rules, goals			
• Provides experiences which promote the development of critical and independent thinking			
2. The appraisee will demonstrate a knowledge of and rapport with students and control of classroom			
• Provides recognition for individual student successes			
• Acts objectively in dealing with students' aggressive behavior			
• Creates an atmosphere of cooperativeness with mutual respect for feelings, rights, abilities of others.			

	Date: ____ Time: ____ Initial Appraisal	Date: ____ Time: ____ Mid-Point Appraisal	Date: ____ Time: ____ Final Appraisal
3. The appraisee will display a physical environment which facilitates positive learning... • Arranges furniture and materials in position for effective attainment of lesson objectives • Displays and uses bulletin boards, charts, pictures, and other visuals to enhance instruction • Controls and changes physical aspects (heat, light, ventilation, etc.)			
Instructional Performance			
1. The appraisee will demonstrate knowledge of subject matter... • Reveals in instructional settings through objectives that the appraisee knows the content of his/her field • Identifies and relates subject matter to school curriculum/instructional program • Relates the subject matter to students' experiences			
2. The appraisee will apply knowledge of materials and techniques in subject field... • Adjusts materials to students' learning ability • Provides a variety of enriching learning materials • Utilizes students' help in establishing objectives, clarifying personal group goals and defining problems for study • Adapts new ideas and techniques			

	Date:_________ Time:_________ Initial Appraisal	Date:_________ Time:_________ Mid-Point Appraisal	Date:_________ Time:_________ Final Appraisal
3. The appraisee will demonstrate planning and preparation....... • Reveals in his/her objectives organized planning to include basic elements, such as: behavioral objectives, instructional activities, summary, evaluation, and assignment or follow-up • Has materials organized and easily accessible • Moves smoothly from one activity to another • Employs flexibility • Shows and maintains evidence of methods for evaluating students and meeting their needs • Organizes objectives to provide for continued growth of students			

MMENTS/RECOMMENTATIONS:

____

____

____

____

FINAL

UNIVERSITY OF THE DISTRICT OF COLUMBIA

1100 Harvard Street, N.W.
Washington D. C. 20009

STUDENT TEACHER EVALUATION: SECONDARY

Name of Student________________________ Date________________________

Subject or Grade Taught________________________ School________________________

Cooperating Teacher use ✓ College Supervisor use X	A Outstanding		C Average		F Failing
	A	B	C	D	F
Competence in subject matter					
Knowledge of pupils					
Providing for health, welfare, and needs of pupils					
Control and influence over pupils					
Competence in motivating learning					
Planning and preparation					
Skillful use of techniques and materials					
Evaluation of pupil progress					
Initiative, resourcefulness, and industry					
Quality of speech					
Meeting responsibilities as a teacher, (out-of-class duties, records and reports, school procedures, school property)					
Professional relationships with teachers, administrative officers, parents					
Courtesy, tact, self control, poise					
Participation in school and community activities (meetings, extra curricular, PTA					
Potential for growth as a teacher					

TO BE COMPLETED BY THE COOPERATING TEACHER:

Recommended Final Grade______

Number of Absences________
Number of Times Tardy______
Comments:

____
Cooperating Teacher's Signature

TO BE COMPLETED BY THE COLLEGE SUPERVISOR:

Recommended Final Grade______

Course Designation
Comments:

____
Signature of College Supervisor

TO BE COMPLETED BY THE STUDENT TEACHING DIRECTOR
Total Hours: Observation ________
Teaching

____
Student Teaching Director

OVERVIEW OF WEEK 4

Week 4:

(a) Review of teaching competencies acquired.

(b) Cross-cultural training.

(c) Secondary projects design and implementation training -- Adult literacy.

(d) Final evaluation of volunteers.

(e) Volunteers evaluation of the PSI training program.

(f) Exit counseling

Outcomes for Week 4:

Each volunteer will design a possible secondary project for Liberia.

Each volunteer will evaluate the training program.

WEEK 4 AGENDA -- PSI PEACE CORPS TRAINING

GROUP A

	Monday January 25	Tuesday January 26	Wednesday January 27	Thursday January 28	Friday January 29
A.M.	8:30 - Bus to Optometrist for Eyeglass neutralization For those who do not wear glasses, use time to collect materials in the field.	8:00 - Meeting with Peace Corps Director (Room E-2_ 9 - 12 - Workshop Development (Room D-3_	9 - 12 - Workshop Presentation (Room D-3)	8:30 - Bus to Shaw for Final Immunizations	9 - 12 - Exit Interviews (Room D-5)
12-1	L	U	N	C	H
P.M.	1 - 5 - Independent Resource Generation (In the field)	1 -4 - Workshop Development (Room D-3_ 4:00 - Meeting with Peace Corps Nurse, Barbara Pyle (Room E-2)	Time to be announced - Liberian Embassy,	1 - 5 - Workshop and Project Evaluations (Room E-4)	1 - 5 - Exit Interviews (Room D-5)
5:30	D I	N N	E	R	
	6:30 - 8:30 Cross Cultural All Group C (Room E-2_	6:30 - 8:30 Cross Cultural (Group C -cont'd (Room E-2_	6:30 - 8:30 Cross Cultural (Groups A & B) (Room E-2_	6;30-8;00 -- Cross Cultural--(Room E-4) (Groups A &B)-cont'd 8:00 Presentation of Certificates of Completion (Room E-4)	

5

TEACHER TRAINING/UNIVERSITY EDUCATION

Measure for Teaching Effectiveness

Name ______________________________________

Directions: Write the letter of the best answer(s) on the line provided.

_______ 1. Educational objectives

- a. describe teaching outcomes
- b. describe evaluative methods
- c. identify learner behavior
- d. all of the above
- e. none of the above

_______ 2. Teaching for Mastery learning

- a. analysis teaching behaviors
- b. is a taxonomy
- c. derives its fundamental hypothesis from a hierarchy of needs
- d. none of the above

_______ 3. Instrumental enrichment

- a. is a process for evaluating educational objectives
- b. results in learning increments
- c. teaches pattern recognition
- d. remediates learning disabilities
- e. corrects for differences in cognitive learning styles

_______ 4. Instrumental enrichment assumes

- a. intelligence is fixed
- b. behavior is modifiable
- c. academic performance is a function of ego formation
- d. none of the above
- e. all of the above

HANDOUTS (GROUP A)

~~5~~01
Lashley

MINISTRY OF EDUCATION, R. L.
DEPARTMENT OF INSTRUCTION

THE REVISED NATIONAL CURRICULUM

LANGUAGE ARTS

FOR
ELEMENTARY SCHOOLS
GRADES IV - VI

CURRICULUM AND INSTRUCTIONAL MATERIALS DEVELOPMENT CENTER
MONROVIA, LIBERIA
1979

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GREETINGS

THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

I great you in the name of the Ministry of Education, Republic of Liberia.

It is indeed a source of pleasure for me to present to you the revised National Curriculum for elementary schools.

For many years Liberia educators have stressed the urgent need for a more relevant curriculum; a curriculum that reflects the cultural heritage and aspirations of the people of Liberia. The revised curriculum is designed to provide functional education for Liberian youths in addition to existing programmes in Liberal education.

Indeed, the revised National Curriculum seeks to fulfil the manpower requirements of our Country. You have in your hands a curriculum which offers a wide variety of educational and vocational experience in the Social Sciences, Natural Sciences, Mathematics, Agriculture, Home Economics, Arts and Crafts, and Music.

While the Ministry of Education has developed this curriculum in consonance with the nation's educational philosophy and collective goals, it is the responsibility of every classroom teacher to interpret the curriculum and impart to their students the experiences developed in this curriculum according to the requirements of any given learning situation.

It is our ardent hope that the revised national curriculum will serve as a basis for educational planning, imporved classroom instruction, and as a gude for teachers in the Liberian educational enterprise.

Yours sincerely,

J. Bernard Blamo
MINISTER

Monrovia
April 1979

FOREWORD

THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

The Ministry of Education is extremely proud of the remarkable strides being made in the process of revising the Elementary School Curriculum for the Nation. This major task commenced nearly ten years ago. Throughout this period it has been revealed that Curri-Development is a continuous process which should involve a cross section of the society. This approach proved necessary to ensure that the prescribed general and specific objectives for learning would reflect the actual needs and goals of the society.

As a result of several years of hard work and numerous efforts we are pleased to note the accomplishments and plans for this program up-to-date:

1. The Elementary Curriculum, which has been revised and improved to include applied skills and work oriented courses in addtion to the fundamental and basic, has gone through three phases of trials, evaluation and revision. The entire effort has been directed to make the curriculum mare relevant, functional and designed to foster more effective learning.
2. The 1979 plans are to put a copy of the revised curriculum in the hands of each elementary teacher. Efforts will be made to have the Nation's Curriculum Center and its network of county materials centers work with teachers in interpreting the objectives and innovations introduced. They will also assist teachers to orientate their instruction to the new approaches required.

The Ministry of Education extends grateful thanks to all who have contributed towards the achievement made thus far with the revision of the Elementary Curriculum. It is our ardent hope that supervisors, principals, teachers and students will play their roles well in utilizing the material to their fullest, noting the curriculum is not to be filed, but used conscientiously to guide instruction. We anticipate their fullest cooperation in presenting the required feed-back and suggestions neeessary for subsequent improvement.

Finally, sincere congratulations go to the staff of the National Curriculum Center who have accepted the challenge to speedily and effectively execute the Ministry of Education's plans regarding curriculum and instructional materials development.

Christine T. Norman
Christine T. Norman
DEPUTY MINISTER FOR INSTRUCTION

CTN:dng.

INTRODUCTION
THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

The Curriculum Revision Project of the Ministry of Education has been underway for quite some time. After years of sustained and concentrated work, we are now ready to present the first revised version of the elementary curriculum in a systematic form to be distributed to schools and teachers throughout the country. This would be gratifying to all those who have been associated with our society, contributed to our efforts. Many institutions, organizations and personnel have helped us in this endeavor as a team task.

Curriculum occupies a central place in national goals and priorities. With the complexity of changing times, new demands are being made upon education as an instrument of discipline, development and democratization. This places fundamental responsibilities on the educational system which can be performed by it through deliberate, suitable changes in objectives, curriculum, instruction, evaluation and personnel trained for the purpose.

The revised curriculum is based on national goals and priorities and is meant to translate the needs and objectives into its organizational pattern. Different content subject-areas are intended to serve as an instrument for attaining the desired objectives. Each content subject-area and curriculum component within it has thus to contribute singly and collectively for the attainment of the set objectives; together they must provide for the totality of a systematic school program for each grade-level.

As educators we must rise to the occasion: teachers, principals, supervisors, administrators, public authority personnel and community leaders must all pull their weight together to help the schools work with the revised curriculum to provide more meaningful educational programs in the nation's schools throughout the country.

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In order to make copies of the Revised National Curriculum available to all schools and accessible to teachers, the following scheme of compilation has been used.

1. Grade-wise: for grades 1 - 3; one complete booklet for each grade containing all the subject areas.
2. Subject-wise: for grade 4 - 6; one complete booklet for each subject area containing the curriculum for grades 4 - 6.

The present distribution of the Revised National Curriculum is the first major step. It will continue to be improved upon as a result of actual class-room use. At the same time, we plan to follow it up with curriculum guides, istructional materials, books and evaluation devices as relevant to the curriculum and its different subject areas.

The National Curriculum Development Center places on record its appreciation and thankfulness to all those who have contributed to our curriculum revision task. We look forward to their continued association and cooperation.

A special vote of thanks is due Mrs. Christine T. Norman, an enlightened educator in her own right: We are deeply grateful to her for her actual participation in the evaluation of the revised curriculum; also for all her help and encouragement to steer us through many difficult times of stress and strain. Without her bold steps and enthusiastic support this task may not at all have been completed.

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NATIONAL CURRICULUM COORDINATOR
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Monrovia
April 1979

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PART ONE:

CURRICULUM BASES

PHILOSOPHY OF LIBERIAN EDUCATION

Conscious of the unprecedented stride taken by education in Liberia during the decade of the sixties, which resulted in a tremendous growth in enrollment and therefore the establishment of make-shift accommodations, and the compulsion to use unqualified teachers because of the shortage of qualified ones; also aware of the devastating repercussions such a situation had on the maintenance of quality and standard throughout the school system, the Ministry of Education was determined to make the Second Development Decade a period for revolutionizing and reconstructing the educational system. Consequently, in November 1970, a three day curriculum conference was convened to analyze the current situation and to work out a strategy for correcting the prevailing weaknesses and problems. The conference brought together officials and representatives from several public and private agencies.

One of the initial actions of the conference was the adoption of a "Philosophy of Liberian Education". It was based on policy statements made by national leaders, notably the message of President W.V.S. Tubman to the nation on July 3, 1965, on the occasion of National Education Week. The philosophy adopted is as follows:

> "Deep within the democratic heritage of the Liberian nation is embedded our commitment to education and the necessity of making our school the chief and most effective instrument ofour political and social institution, in order that the democratic ideal may not only be meaningful in the present, but that it will become the spearhead of economic, social, political, moral and spiritual reform in the lives of succeeding generations;
>
> "Our total educational program must be such that it will motivate in the learner a respect for the dignity of every human being; develop and appreciation for the dignity of labour; instill in them a desire for learning; and a desire to attain self-reliance and the fulfillment of self-realization. Furthermore, the program must be based on the irrevocable belief that universal education is not only desirable but essential to the success of a democratic society;

GOALS AND PRIORITIES FOR LIBERIAN EDUCATION

The long term goals of the Education Program are:

1. To develop the total individual so that he will become a loyal citizen and make useful and continuous contribution toward his own development and that of the nation;

2. to provide universal, basic education through the formal and non-formal process, so as to help the masses improve their living standard and tackle the immediate problems of literacy, sanitation, food production and preservation.

3. to strengthen scientific and technological learning as a basis for the speedy industrialization and economic advancement of the nation;

4. to stimulate, conserve and promote the cultural heritage as well as the national policies of unification and integration; and
5. to ensure equitable geographic distribution of educational opportunities.

These goals are to be achieved during the plan period through programs and projects centered around the following priorities:

1. Qualitative improvement of the instructional program through the
   (a) production and retention of qualified teachers and educational specialists;

   (b) development of a functional, diversified and relevant curriculum.

(c) provision of adequate physical facilities; and
(d) development of an efficient supervisory system;

2. Production of an efficient and adequate manpower to meet the nation's needs, with emphasis on vocational and technical education;
3. Strengthening the organizational and managerial infrastructure of the educational system, including regional decentralization of control; and
4. Expansion of basic, non-formal educational opportunities.

THE REVISED CURRICULUM OBJECTIVES FOR ELEMENTARY SCHOOL

The aims and objectives of the elementary school program are translated into action terms in the revised curriculum which makes provision for pupils to acquire the skills necessary for:

(a) Communicating effectively;
(b) Calculating and numerating with ease;
(c) Understanding the physical environment developing social and the technologically oriented world;
(d) Understanding the social environment, developing social and ethical values, and equipping for effective civic participation;
(e) Preparing for productive use of leisure and aesthetic self-expression;
(f) Acquiring manual dexterity and appreciation for the dignity of labour as a preparation for subsequent training and employment; and
(g) Laying foundations for continuing education.

REVISED CURRICULUM FOR LANGUAGE ARTS-ENGLISH IN THE ELEMENTARY SCHOOL: INTRODUCTION

Language Arts in the Elementary Curriculum is primarily intended to provide meaningful experiences and develop worthwhile habits which will enable the pupil to comprehend appropriately and communicate effectively in English in order to function in life and use the language as a tool for further learning.

In the earlier grades much stress is geared towards developing the ability of the pupil to understand and speak the language. The pupil learns to listen to simple sounds of nature and interpret them. Listening at this state is very successful when it comes to recalling directions, poems, stories. The pupil learns how to listen to phonetics and repeat the sounds.

In the latter grades, the focus turns to written communication. The pupil then proceeds to write as well as speak the language with a reasonable degree of skill. Also the pupil learns to develop an appreciation of good literature-Liberian, African and the International Community around. The language is gradually integrated into the other subject areas and used as a tool for further learnings. Consequently, the pupil becomes a skillful communicator in our official language.

The curriculum suggests some interactions that should be useful for each level of content activities. The Language Arts program also integrates other subject areas into its scope.

PART TWO:

GRADE LEVEL CURRICULUM

LANGUAGE ARTS CURRICULUM

GRADE FOUR

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OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupils to:

1. Communicate in English both orally and in written composition effectively for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension).
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, linguistic, and ethical environment and observe the role of language as a conveyor of the cultural hertitage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts English Program being stated gradewise in terms of the abilities, skills interests, and habits to be developed are reinforcdd at each grade level.

Grade IV

1. Ability to:

   a. Write sentences
   b. Capitalize
   c. Use correct margin
   d. Listen and comprehend
   e. Recognize phonetics and structure of words
   f. Copy from resource materials
   g. Speak with articulativeness
   h. Recite poems
   i. Recognize descriptive words in phases
   j. Read continuously
   k. Participate in class interaction

SCOPE AND SEQUENCE CHART

Grade Four

ORAL COMMUNICATION (SPEAKING)

Skills taught in previous grades are reviewed and developed: Emphasis is placed on articulation evidenced by dramatization, speeches making annoucements, reading poetry, and discussions.

LISTENING

The skills used for listening in previous grades are integrated into other content areas. Evaluation is shown through pupil's ability to interpret information or details.

WRITTEN COMMUNICATION

Review Grade III; Emphasis placed on obtaining fluency in cursive handwriting. Also writing letters and other communication.

READING

Analyzing the story: (1) Intsoduction (2) Discussion Oral and silent reading, Reason for reading: (a) pleasure (b) information. Identify and evaluate Literary forms, initial exposure to good authors

WORD STUDY

Learn new words from literature phonetic terms to be mastered:
(a) consonants (b) vowels (c) blends (d) double consonats
Different kinds of words: (a) root (b) inflectional (c)derived

Reading Plan

Pupils in fourth grade will do as much silent as oral reading. Lessons may be carried on in a variety of ways:

Pupils may read silently to find answers to questions.

Selected parts of a story may be read orally.

Stories may be dramatized

Pupils may read part of a story and make up their own ending, then compare with the author's ending, etc.

The suggestions in the teacher's manual should be followed in developing a lesson. A story will take more than one day to be effective.

One or more periods will need to be spent on word attack skills, developing vocabulary, and other mechanics of reading.

1. Introduce the story

Talk about the story and explain the incident and word meaning for the pupils. If a story has a setting in another country, for example, talk about that country and how the people live. If the characters have an experience foreign to the pupils, try to give them understanding.

2. Learn new words

New words for the lessons are given in the teacher's manual. These should be introduced before the material is read. Write them on the board, sound them out, use them in phrases and in sentences so that the pupil sees, hears, and uses the words. Divide the word into syllables when the situation occurs.

3. Read silently

Pupils should have an opportunity to read silently before reading aloud.

4. Discuss the story

Encourage pupils to think and to talk about what they have read in terms of their own experiences.

5. Read orally

Plan to read the entire story or parts orally.

Pupils need to be taught how to read silently. To begin with tell them: "Read to find out why John became startled," or "Read to see what you would have done."

Note: Be certain that each pupil can read at the level expected of him. If a pupil misses more than one word out of twenty running words, if he has to be told every fourth or fifth word, the book is too difficult. He will become frustrated and will not learn when this is the case. A group of children in class may read an easier book, or one pupil may need to be given extra help and practice reading out of an easier book. To succeed in reading, a pupil must believe he can succeed.

The suggestions for introducing reading and learning new words should be followed throughout the school year.

I. READING SKILLS AND CONCEPTS

A. Vocabulary Development

1. At this level the dictionary is an indispensable tool for learning the meaning and pronunciation of unknown words. Much time should be spent to reinforce and stress the use of the dictionary.
    - (a) To locate words quickly.
    - (b) To translate the pronunciation symbols or keys.
    - (c) To choose the meaning intended by the Author and to adopt the meaning to the sentence in which the word is used.
2. Review and reinforce homonyms, synonyms and antonyms.
3. Identify root words in inflected or derived forms. (Many lessonsare developed to help teach the children how to use a dictionary).

B. Word Analysis

1. Phonetic Analysis - Noting the various sounds and symbols each sound stands for in a word.
2. (a) Teach the children that printed language represents spoken language.
    - (b) That spoken words are patterned arrangements of consonant and vowel sounds.
    - (c) The consonant and vowel sounds are represented by letters in printed words.

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(d) That a letter (or combination of letters) may represent more than one sound.

(e) That the same sound may be represented by more than one spelling pattern (eg. book, blow, broke, boat).

(f) That the relationship between consonant letters and consonant sounds is relatively stable.

(g) That every vowel letter represents more than one sound and the vowel clue to vowel sound is the spelling pattern (a = bake, bar, bat, bare).

(h) That words may have one or more than one syllable.

(i) That in words of more than one syllable, one syllable is accented more than the other or others.

(j) Visual clues to vowel sounds usually apply only to accented syllables.

(k) The vowel sound heard more frequently in unaccented syllables is the schwa ( ) which may be represented by any vowel letter.

(l) These are phonetic terms to be stressed and mastered.

- (I) Consonants - B C D F G H J K M N Q S T V W Z Y P
- (II) Vowels AEIOU sometimes "Y" when it is at the end of a word
- (III) Consonant blend - br, pl, sm, st, str.
- (IV) Consonant digraphs th, wh, ph, ch, sh, etc.
- (V) Vowel diphthongs = oi, ai, oy, ay
- (VI) Slight letter - wr = wright; kn - knight, gh = night
- (VII) Double consonant (eg. letter lesson)
- (VIII) Consonant substitution

(m) Usual clues to vowel sounds in one syllable word should be stressed and mastered.

- (I) A single vowel letter followed by one or two consonant letters is usually short. lamp lap cat Cathy
- (II) A single vowel letter followed by one consonant letter and final e usually is long. late pete
- (III) A single vowel letter followed by two consonant letters and final e usually is short. dance fence
- (IV) A single vowel letter followed by r the vowel sound is usually r controlled bar large term serve etc.
- (V) A single vowel letter at the end of a word usually stands for long sound be, no, hi, me

(VI) Two vowel letters coming together in a word usually stand for a long vowel sound. main, sea, sea boat

(VII) Two consonant letters coming together followed by an r the vowel sound is probably r controlled.

(VIII) The letter ay, ae, or, ir together at the end of a word usually stand for a long vowel sound.

(IX) The letter a followed by two l's or by [illegible] and another consonant letter usually stands for the vowel of all.

(X) The letter a followed by w usually stands for the vowel of all.

(XI) The letter i followed by gh usually stands for the long i sound.

(XII) Review and emphasize the function of the Pronunciation key - which is the key listing the symbols used in the pronunciations.

1. To be able to pronounce words written in pronunciation symbols.
2. To be able to spell words in pronunciation symbols.

II. STRUCTURAL ANALYSIS

(a) Teach children that a word may be a

1. Root Word - (play)
2. Inflected form (played)
3. Derived form (playful)

(b) That a root word retains its meanings in an inflected, derived or compound form.

(c) That an affix (an enduring prefix, or suffix) has a meaning and/or function.

(d) That the meaning of an affix combined with that of a root word mark an inflected or derived form.

(e) That the spelling of a word may change before an ending or suffix.

(f) That although the intonation of speech are completely presented in language, punctuation and certain other graphic devices provide clues.

(g) That language grows and changes as new words are coined for new products inventions, experiences. Words are borrowed from other language, old words take on new meanings and uses.

(h) Teach the children to scrutinize the whole word before analysis.

(i) Teach the children to perceive syllables and accent.

C. COMPREHENSION AND INTERPRETATIVE SKILLS

1. Help the children recognize purpose for reading.
    - a. For pleasure
    - b. To gather information and facts
    - c. To inform others
    - d. To criticize
2. Teach the children to comprehend literal (word for word) and implied meanings of words, phrases, sentences, and longer passages.
3. Teach children to perceive relationship as they read. (Sequence, cause-effect) part, whole, time, space, time-place-value, analogous, general-specified class size, between details, between main ideas and supporting details, between units of meanings in different word form).
4. Teach children to follow sequences of ideas as they read.
5. To note and recall details of what is read.
6. To grasp main idea and identify supporting details.
7. To identify internal clues of recognizing roles of individual paragraphs in total pattern of writing.
8. To form and react to sensory images.
9. Make and check references.
10. To anticipate action, emotion response, or outcome.
11. To compare and contrast - characters, settings, themes, purpose.
12. Sense emotional reactions, infer motives and identify personal traits of story characters.
13. Evaluate actions and personal traits of story characters.
14. Identify points of view and attitudes of story characters.
15. Organize and summarize ideas.
16. Help children to react to content, link it to personal experiences and assimilate ideas.
17. Evaluate, make judgement, draw conclusions and generalize in light of author's purpose, mood, or attitude.
18. Follow sequence, and recognize a well constructed plot.
19. Recognize and respond to clues to pace, mood, pitch, intonation, stress and rate in oral reading.

20. Locating information for specific purposes - from different types of reference materials.
   a. Use alphabetical arrangement and guide words
   b. Use of dictionary, index, encyclopedia, library card, index and other sources.
   c. Use of table of contents, chapter, titles, section, title topic and headings to locate information.

21. Recognize and identify ways an author protrays or reveals characters.

22. Identify and evaluate element of style used by the author.
   a. Figurative language; picturesque and idiomatic language; colloquialism, slang and delect, personification.
   b. Refrain, repetition and rhythm, onomatopoeia.
   c. Choice of words, sentence structure and punctuation.
   d. Foreshadowing and flashback.

23. Identify and evaluate Literary forms. The children should be exposed to and encouraged to read and appreciate each of these forms. By doing we will encourage not only good readers but also Liberian writers of each of the forms.

A. POETRY - HIAKU, SONNET, BALLADS
   1. Simple poetry and verses
   2. Sonnets and Ballads
   3. Hiaku - Japanese style
   4. Etc.

B. PROSE

NON-FICTIONS
   1. Newspaper articles and magazines
   2. Letters
   3. Reference Materials (Atlas, Almanac, Encyclopedia, Dictionary, Documentary).
   4. Autobiographies and Biographies
   5. Essays, composition, report.
   6. Sermons, speeches

C. FICTIONS

1. Historical
2. Science
3. Mystery
4. Drama
5. Myths, legends, fairy tales
6. Everyday life fiction
7. Identify and evaluate author's purpose and the techniques used to achieve his purpose.

D. DEVELOPING SKILLS IN ORAL AND SILENT READING:

At this level equal emphasis must be placed on vocabulary development; analysis skills; and the comprehension and interpretative skills which are spelled out fully under subheadings A, B and C.

There should be a special period preferably Spelling Period to develop the word analysis skills. The comprehension skills should be attacked and discussed fully as silent and oral reading lessons are conducted. Both silent reading and oral reading should be for a purpose. The purposes are those spelled out under subheadings C 1 - 33

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation of materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINES FOR EVALUATION

Grade IV

Pupils will read aloud and interpret what is read. Pupils will also read silently and write interpretation. Teacher can evaluate the outcome of work done separately. Pre-tests are applicable here to test pupils' ability to read. Written evaluation is also necessary for word study.

NOTE: At all levels the teacher must be alert enough to make some subjective evaluation as well.

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LANGUAGE ARTS CURRICULUM

GRADE FIVE

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OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupils to:

1. Communicate effectively in English both orally and in written compositions effectively, for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension),
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, linguistic and ethical environment and observe the role of language as a conveyer of the cultural heritage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts English Program are being stated grade-wise in terms of the abilities, skills, interests, and habits to be developed and reinforced at each grade level.

Grade V

Ability to:

a. Write simple paragraphs
b. Construct written communication
c. Use correct margin
d. Listen and comprehend
e. Recognize phonetics and structure of words
f. Copy from resource materials
   eg. dictionary, encyclopedia
g. Speak with articulativeness
h. Make speeches
i. Recognize descriptive words in phrases
j. Read
k. Participate in class interaction

Interests and habits needed to:

a. Speak with courtesy
b. Differentiate the types of sentences
c. Develop vocabulary
d. Understand instructions
e. Learning of words
f. Differentiate between singular and plural words
g. Communicate effectively
h. Become exposed to literature and authors
i. Recall information orally
j. Apply reading ability to other content areas.

SCOPE AND SEQUENCE CHART

ORAL COMMUNICATION (SPEAKING)

Work done in Grade IV extended

LISTENING

A further development of Grade IV including participating in discussions, relating events, giving opinions on news, newspapers, magazines and other informative materials.

READING

Distinguishing facts from fantasy and opinions. a. Using dictionary b. Using diacritical marks c. Skimming d. Locating information e. Analyzing author's purpose f. Analyzing the story g. Elements of style h. Developing characteristics of a competent reader i. Development of Grade IV

WRITTEN COMMUNICATION

Extension of Grade IV

WORK STUDY

Development of Grade IV

GRADE FIVE

READING

Reading skills mastered in Grade Five should be extended to the other content areas and not only confined to the reading program. At this level of reading instruction, skills and concepts acquired in vocabulary development, word analysis and dictionary usage are reviewed, reinforced, and expanded. Comprehension now demands more matured thinking as reading materials are more complex and include longer sentences and stories, historical fiction, drama, poetry and biography.

Since reading ability is not mastered at any particular age or grade level, silent, oral and independent reading are continued to be stressed. Children who have reading deficiencies are given individual help according to their weaknesses.

1. READING SKILLS AND CONCEPTS

VOCABULARY AND WORD ANALYSIS

A. Vocabulary and word analysis skills are reviewed and expanded. Dictionary skills are continued to be developed and reinforced on the intermediate level. See skills and concepts for the elementary grades.

B. COMPREHENSION AND ATTITUDES

1. Getting the central idea of a selection
2. Reading to solve problems and answer questions
3. Predicting outcomes on the bases of clues given by the author
4. Adopting an inquiring attitude
5. Learning about the author or authors
6. Matching ideas with paragraphs
7. Skimming to verify statements and specific details
8. Using the dictionary
9. Using diacritical marks
10. Learning to distinguish facts, opinion and fantasy
11. Locating and organizing information for specific purpose
    a. Use content pages
    b. Use index
    c. Use headings

12. Using table of contents and section title
13. Receiving the author's mood and purpose
14. Interpreting the character's intent and behavior from author's clue
15. Forming opinion
16. Identifying important and unimportant ideas
17. Analyzing conclusions
18. Finding the climax of a story - climax means the height of the problem before it is solved.
19. Determining the plot of the story - the main problem of the story
20. Author's purpose - point of view
21. Summarizing ideas
22. Identifying and evaluating elements of style used by the authors:
    a. Figurative language - language that can not be interpreted word for word.
        i. Metaphor - one kind of object or idea is used in place of another to show likeness e.g. the ship plows the sea.
        ii. Personification - speaking of something that is not a person as though it were. e.g. the trees bowed their heads in silence.
    b. Picturesque language - words that point a picture in a story.
    c. Flashback - breaking the uniformity of sequence by adding events of earlier happenings.
    d. Idiomatic language - a style of expression that is characteristic of an individual, a period of movement e.g. "Well, you can't talk", you have your meal brought in.
    e. Foreshadow - suggesting or pointing out what will happen later in a story. To present beforehand.
    f. Refrain - a regular repeated phrase of verse especially at the end of each stanza or division of peem or song or chorus.
        i. Repetition
        ii. Rhythm
        iii. Rhyme
        iv. Alliteration - each word in a sentence begins with some letter

23. Developing attitudes, habits and interests that characterize the competent reader.
    a. Deciding what the topic of a paragraph is
    b. Encourage reading for purpose
    c. Encourage use of reference material if available
    d. Recognize and select books to satisfy personal interest for specific purpose
    e. Recognize a well-structured plot
    f. Note taking is important
    g. Outlining is stressed
    h. Making judgement

24. Noting function of subheads in an index

25. Integrating new ideas with past experiences

26. Paraphrasing - demanding meaning of what is read

27. Introducing Literary Forms
    a. Poetry
    b. Prose

    1. Non-fiction
        a. Newspaper articles - make children develop the interest of reading our daily news organs
        b. Magazines
        c. Speeches
        d. Essays
        e. Biographies
        f. Autobiographies

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation of materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINES FOR EVALUATION

Grade V

Pupils will read aloud and interpret what is read. Pupils will also read silently and write interpretation. Teachers can evaluate the outcome of work done separately. Pre-tests are applicable here to test pupils' ability to read. Written evaluation is also necessary for word study. Also the pupil will write opinions or critiques of literature read.

GRADE FIVE

READING REFERENCE AND RESOURCE MATERIALS

1. Trauger, P., Language Arts in Elementary Schools, (McGraw-Hill Inc., London, 1965) Series 5
2. National Council of Teachers of English, English for Today (McGraw-Hill Inc., London, 1965) Series 5
3. Anderson, Freeman B. et al. New Directions in English Series 5 (Harper & Row, Publisher, London, 1969)
4. Gogg. J. C. Evans Primary English for Sierra Leone Book 5 (Evans Brothers Limited, London, 1975)
5. Ogundege, P.A. and Tregidgo P. Sa. Pratical English &(Longman Groups Limited, London, 1977) Series 5

LANGUAGE ARTS CURRICULUM

GRADE SIX

PAGE

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OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupil to:

1. Communicate in English both orally and in written compositions effectively, for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension).
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, liguistic and ethical environment and observe the role of language as a conveyor of the cultural heritage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts - English Program are being stated grade-wise in terms of the abilities, skills, interests, and habits to be developed and reinforced at each grade level.

Grade VI

Ability to:

- a. Write paragraphs
- b. Construct written communication
- c. Use correct margin
- d. Listen and comprehend
- e. Recognize phonetics and structure of words.

f. Copy from resource materials such as encyclopedia, dictionary
g. Speak with articulativeness
h. Making speeches
i. Recognize descriptive words in phrases
j. Read
k. Participate in class interactions

Interests and habits needed to:

a. Speak with courtesy
b. Differentiate the types of sentences
c. Develop vocabulary
d. Understand instructions
e. Learn meanings of words
f. Differentiate between singular and plural words
g. Communicate effectively orally and in writing
h. Become exposed to literature and authors
i. Recall information orally

SCOPE AND SEQUENCE CHART

ORAL COMMUNICATION (SPEAKING)

Participate in conversations at home and at school; on the telephone using proper pronunciation in speech.

LISTENING

Listening and participating in poetry; choral speaking discussions and further reinforcement of Grade II.

WRITTEN COMMUNICATION

Extension of Grade III to include: Writing sentences - forms, kinds and parts; Composition - letter writing, writing stories.

READING

Elements and characteristics of reading are not limited to Language Arts but spread over all content areas.

WORD STUDY

Use of the dictionary.

GRADE SIX

READING

Listening, Oral and Written Communication

Language on the level of any grade level should be planned in a systematical way.

Since language is a means of communication, the work of the Sixth Grade level should be designed for the continuous every day growth of pupils in listening, oral and written expressions.

Therefore, the basic part of this section (language) deals with the correct usage of Writen and Oral Communication, and Listening. It would be wise on the part of any teacher to teach these topics with discretion. It is not worthy to mention that handwriting should at all times be corrected.

I. ORAL COMMUNICATION
  A. Using proper pronunciation in speech.
    1. Phonetics
    2. Saying words clearly and distinctly
  B. Discussion and conversation
    1. Difference between discussion and conversation
    2. Conversation on the telephone
    3. Conversation at home
  C. Listening and participating in
    1. Ballads and story poems
    2. Creative mood in poetry
    3. Choral speaking
    4. Making introduction
    5. Giving description
    6. Receiving and giving messages
    7. Preparing for and implementating a Round Table Discussion.
  D. Using the Dictionary

II. WRITTEN COMMUNICATION

A. FUNCTION AND USES OF GRAMMAR

1. Parts of speech
2. Correct usage of parts of speech

B. MORE ABOUT SENTENCES

1. Distinguishing between sentences and sentence fragments
    - (a) Reviewing meaning of a sentence
    - (b) Reviewing sentence fragment
2. Kinds of sentences
    - (a) Sentences according to use
        - i. declarative
        - ii. imperative
        - iii. interrogative
        - iv. exclamatory
    - (b) Sentences according to form
        - i. Simple
        - ii. Compound
        - iii. Complex
        - iv. Compound - Complex
3. Parts of a sentence
    - (a) Subject
        - i. Simple subject
        - ii. Compound
        - iii. Interrogative
        - iv. Exclamatory
    - (b) Predicate
        - i. Simple predicate
        - ii. Complete predicate
4. Position of subject in a sentence
    - (a) Usual and unusual position
    - (b) Subject and verb in interrogative and exclamatory sentences
    - (c) When subject is not given
5. Compound subjects and predicates

C. PARTS OF SPEECH

1. Nouns
    - (a) Definition of nouns
    - (b) Common and proper nouns
    - (c) Cases and genders of nouns
    - (d) Persons and numbers of nouns
2. Pronouns
    - (a) Definition of pronouns (with examples)
    - (b) Kinds of pronouns
    - (c) Cases and genders of pronouns
    - (d) Persons and numbers of pronouns
3. Verbs
    - (a) Kinds of verbs
    - (b) Agreement of verb and subject
    - (c) Using contraction
    - (d) Using negatives correctly
    - (e) Principal parts of verbs
    - (f) Verbs frequently misused
4. Adjectives
    - (a) Adjectives as modifiers
    - (b) Predicate adjectives
    - (c) Proper adjectives
    - (d) Comparison of adjectives
5. Adverbs
    - (a) Adverbs as modifiers
    - (b) Irregular adverbs
    - (c) Comparison of adverbs
    - (d) Other parts of speech - preposition, conjunction, interjection

D. BUILDING GOOD PARAGRAPHS

1. What a paragraph tells about
2. Topic sentences
3. Constructing paragraphs
4. Order in a paragraph

E. WRITTEN REPORTS
  1. Signals
  2. Uses of commas
  3. Quotations
  4. Abbreviations
  5. Uses of capital letters
  6. Writing titles of things you have read
  7. The apostrophe

F. LETTER WRITING
  1. Kinds of letters
  2. Capitalization and punctuation in letters
  3. Writing friendly letters
  4. Writing thank-you letters
  5. Invitations
  6. Business letters
  7. Preparation for mailing

G. WRITING STORIES
  1. What a story is
  2. Getting ideas for original stories

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) and proceeds through the entire learning process (formative evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINE FOR EVALUATION

Grade VI

Pupil will apply concepts of speech and other oral communication to reading. Evaluation - written - will be made of the use of the dictionary and grammar. Oral evaluation here is made primarily for pupil's enrichment and serve as a guide to the teacher while making subjective evaluation.

NOTE: At all levels the teacher must be alert enough to make some subjective evaluation as well.

EVALUATION DEVICES

- A Brief Explanation -

1. Pre-tests:
   Taken from the textbook series in which the pupil or pupils will be instructed for appraising capability and achievement before choosing materials and beginning instruction. The selection from each book may be presented one from the beginning, one from the middle and one from near the end.
2. Teacher-Made Class-room Tests:
   After students have covered a unit, some units or one subject area a teacher can make up a test out of the covered content and from pupil's daily exercises.
3. Homework:
   Students may be assigned some homework to be turned in on any given day. A record of the exercises thus completed by the student may also be used in the construction of terminal tests
4. Vocabulary Inventories and Record Keeping:
   An inventory of the pupil's vocabulary should be kept as a diagnostic information to indicate the pupil's progress.
5. Student Self-Evaluation:
   This is appropriate only for the upper elementary level. Teachers should devise a workable technique for student's self-evaluation.

6. Standardized Tests (if available)

Mostly group tests that will measure the students' vocabulary and comprehension in Language and Literature.

7. Teacher Self-Evaluation:

By constructing a suitable scale to evaluate his/her own teaching strategy, materials and activities used to achieve specified objectives in a program or classroom situation, the teacher learns how to improve his/her instruction.

READING REFERENCE AND RESOURCE MATERIALS

1. Trauger, P., Language Arts in Elementary Schools, (McGraw-Hill Inc., London, 1963) Series 6

2. National Council of Teachers of English, English for Today (McGraw-Hill, Inc., London, 1963) Series 6

3. Anderson, Freeman B. et. al New Directions in English Series 6 (Harper & Row, Publisher, London, 1969)

4. Gogg. J.C. Evans Primary English for Sierra Leone Book 6 Brothers Limited, London, 1975)

5. Moore, Bai T. Ebony Dust (International Copyright Convention, 1963)

6. Ogundege, P.A. and Tregido, P.S. Practical English & (Longman Groups Limited, London, 1977) Series 6

MATHEMATICS

Introduction

A Technique in Teaching Story Problems for Elementary, Junior and Senior High Teachers	Keith Winters PCV (Presented by Tom Walsh)
Word Problems	Tom Walsh Harper
A Three-Step Approach to Self-Paced Math Instruction	Ron Adams Voinjama
Preparing Students for the National Exam in Mathematics	Ed McFee Shellce
HCF and Metric Conversion	Glenn Baaba Kolahun
Geometric Reasoning	Jaime Laracuente Grandcess
Grading: A Problem of Averages	Chuck Davis Heindii
First to Whatever Number--a game	Bruce McQuade Juarzon
Math Anxiety	Tom Wheeler

Introduction

As is evidenced by the following articles, there was much variety to the discussions held and presentations heard during the five Math content sessions. All that was done during the three-day period however, does not appear in this section in report form. While the write-ups need no further explanation here. I would like to comment briefly on some of the other discussions and one activity which are not given mention on the following pages.

In order for people to become acquainted (or re-acquainted, as the case may be) with each other, and as a way of initiating some thinking on both general and math-specific concerns, Bruce McQuade led a discussion on Sunday afternoon in which the following questions were posed:

- What topic did you find the hardest to teach?
- What topic was blown, and why?
- What was the biggest discipline problem which you encountered?, and What type of student behavior bothers you the most?
- What problems result due to a poor administration?

These questions were asked after we had split into three groups (about four in each group). On two occasions, after finishing with a question, the make-up of the groups was changed, giving a better opportunity for people to familiarize themselves with each other. At the completion of the last question, what had come out in the small-group discussions was briefly shared in one large-group discussion.

The responses to the questions were varied, and as many likely surfaced again in the "Problems Teachers Face" session, I will not attempt a compilation here. The primary value of Bruce's exercise was in the focusing of thinking upon issues which were to be discussed many times later in the course of the three-day workshop, and in the beginning of the thoughtful discussion which was to characterize the following four content sessions.

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Most of the material appearing in the following reports was presented during Monday's sessions and during the first of the two Tuesday-morning sessions. The second session on Tuesday morning was composed of short presentations and discussions which are not found in the reports but deserve some comment.

Bill Hendrickson discussed and illustrated the solving of quadratic equations using the factoring -, completion of the square -, and formula methods, and also stressed the importance of showing students how the formula for solving quadratic equations is derived.

Tom Hankins reported on some success which he has had in getting students to copy material from the blackboard more quickly, and on his initial finding that many of the students already had the ability to write quickly, but had apparently never been encouraged to do so. Tom also presented a method, using Venn diagram and a table, to explain and to derive a simple formula for the solving of the "set union/intersection problem" which commonly appears on the 12th - grade national exam. Unrelated to either of the two previous topics, Tom talked about his posting of solutions to homework problems as a way of increasing the amount of attention being paid to him by the students as he is reviewing the problems at the board. With the opportunity given to the students for the copying of the solutions after class, Tom has been able to get the students to listen more carefully to what is being discussed in class.

During the same session, Tom Walsh demonstrated a simple bottle cap game which led to the playing of Bruce McQuade's "First to Whatever Number" game (similar in designing to Tom's). "First to Whatever Number" is explained in one of the following write-ups.

......../3

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......../3

A TECHNIQUE IN TEACHING STORY PROBLEMS FOR ELEMENTARY, JUNIOR AND SENIOR HIGH TEACHERS

(presented by Tom Walsh)

For nearly all elementary, junior and senior high school students story problems seem to be one of the biggest mathematical hurdles to overcome. In an attempt to solve a story problem a student must first read and comprehend the ideas being expressed and then logically express this information in some sort of arithmetic or algebraic form. As a teacher your approach in teaching this area of math should be centered around these two ideas. Comprehension of the written problem and interpreting the problem in a mathematical form. The final step or what is called calculating the answer" is normally an easy and straightforward process.

There is no easy or quick method that develops a student's reading comprehension but rather a student slowly improves his or her reading ability through practice. Simplified word problems should first be introduced where the student will gain a sound understanding of basic mathematical terms that are commonly found in more difficult story problems (see additional sheet)__ These words at a junior or senior high level can easily be incorporated. Examples:

1) A common multiple of 6 and 9 would be?
2) A $3 50 can of Nido sold at $3 10 would have a percent discount of what?
3) The circumference of a circle with a radius of [illegible] inches is what?

At the elementary level similar but simplified examples could be·

1) The even number greater than 6 is?
2) One third of 27 equals?
3) How many quarters (25¢ will make five dollars ($5.00)?
4) The average of 7 and 9 is?

In addition to mathematical terms a vocabulary list should be introduced to your students that covers the four basic mathematical operations and equality. With this list the students will be able to directly interpret a word within the story problem to its mathematical operation (see additional sheet.) A class activity for interpreting these words could be as simple as "filling in the blank". Examples:

1) Esther is three years younger (____________)than Agatha. If Agatha is (_____) 19 years old now how old is Esther? ans_____
2) A whole number is doubled (______) and the result is 14. What is the whole number? ans.________.
3) A twelve foot plank is cut (_______) into three equal pieces. Each piece will be (______) how long? ans._____

The most difficult story problems result from a combination of mathematical terms and words found in the vocabulary list. These problems should be introduced only after the student has shown some development in reading comprehension and a basic understanding of word interpretation. Examples at the junior high or senior high level are:

1) if one side of a square is increased by 8 feet and an adjacent side decreased by 2 feet, a rectangle is formed whose perimeter is 40 feet. Find a length of a side of the square.
2) The result if 70 is increased by 10 percent is?
3) The sum of two variables is 63. If one variable is 6 times the other variables, find each of the variables.

For elementary students a simplified version could be:

1) 5 weeks ago Kwia was born. How many days old is Kwia today?
2) School begins at 8:00 a.m. and each period is 45 minutes long. After the second period what will be the time?
3) Two inches shorter than one foot totals how many inches?
4) The product of 5 and the average of 7 and 15 is?

EXAMPLES OF MATHEMATICAL TERMS FOR JUNIOR AND SENIOR HIGH STUDENTS

solution, root, multiple, factor square, cube, area volume, perimeter, circumference, variable, unknown, rate, ratio, percent, commission, dividend, interest, discount.

EXAMPLES OF MATHEMATICAL TERMS FOR ELEMENTARY STUDENTS

less than greater, than even, odd, whole number, fractional, half, third, quarter, ect ; decimal multiples; 2,4,6,8..... or 3,6,9,12.....ect.; rounding off average, mean, ratio pi, circle, cylinder, square, cube, area, square inches feet, yards, ect.: volume: gallon, quart, pint, etc.: measurement: mile yard, foot, inch meter weight: pound ounce gram: time: week day, hour; money: half dollar (½) quarter (¼), cent ($\frac{1}{100}$)

VOCABULARY WORDS COMMONLY FOUND IN STORY PROBLEMS
for elementary jr. and sr. high)

ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION	EQUAL TO
increase	reduction	product	half	result
more	difference	times	third	is
sum	less	double	fourth	will be
add	decrease	twice	quotient	are
older	ago	square	goes into	total
from now	younger	cube	cut	cost
exceeds	slower			
faster	diminished			
longer	shorter			
gained	lost			
how much	off			
	left			

WORD PROBLEMS

1. It is 18 miles from Harper to Pleebo, 24 miles from Pleebo to Nyaake and 53 miles from **Nyaake** to Kahnwiake. What is the total distance?

2. A moneybus travelled from Voinjama to Sanniquellie. It first went to Zorzor, 64 miles from Voinjama, then to Gbarnga. 70 miles from Zorzor. It then travelled to Ganta 46 miles from Gbarnga, and finally to Sanniquellie 25 miles from Ganta. How long was the trip?

3 There are 156 days of school. If 14 days are off for holidays. 18 days are off for rain and 5 days off for funerals, how many days are left?

4. Three women were washing. One had 7 lappas to wash, the other two each had 13 lappas to wash. How many lappas were to be washed?

5. Five Kru boats were in from fishing. One caught 95 fish one caught 101 fish two each caught 152 fish, and one didn't catch anything How many fish were caught that day by the Kru, totally

6. Five women are in the market. Two each have 25 fish, three each have 19 fish. A boy buys 10. How many are left, in all?

7. You are selling fish. You have 12 pieces and you are selling them for 50¢ each. A woman next to you is selling fish at the same price, but she only has 9 pieces. How much more money will you make than her?

8. If Tom's family eats 3 cups of rice a day, how many days will 27 cups last?

9. There are 42 fish in the market. If 6 women each buy 7 pieces, how many will there be left?

10. If kerosene costs x cents for a bottle full, how many bottles can be bought for $4.00?

11 If rice costs y dollars for 100 lbs. how much can be bought for $50,000?

12. Victor has 3 footballs. . If he gives 1 away. what fraction of the total will he have left?

13. Doe has 20 bananas If he gives 4 away what fraction of the total will he have left?

14. If it takes you 50 minutes to get to school and school starts at 8:40 a.m. when do you have to leave your house to make it there on time?

15. Add: 4hrs, 16mins, 6hrs. 41mins., 8hrs., 25mins., and 2hrs., 42 mins.

16. Spider has 300 lbs, of rice he wants to move across a river. If the canoe he is using will only hold 75 lbs. and spider, how many trips will he have to make?

17. Spider falls into a hole 30 feet deep. Every day he climbs 3 feet up and each night he slips back down 1 foot while he sleeps how many days will it take him to get out of the hole?

18. It takes 800 palm nuts to make one gallon of palm oil. If a woman has 3½ gallons, how many palm nuts did she use?

19. A student takes 11 minutes to solve a problem. If he has 27 problems to solve how long will it take him in hours and minutes?

20. A farmer has a family of 9. If it takes 1/3 of an acre to feed one member, how many acres must he brush to feed his family?

21 1 Cup of rice feeds two children. If you have 27 cups, you can feed 4 children for how many days?

22. A man makes palm wine every day. He taps 1½ gallons every day. If he does it for two weeks but takes Sundays off, how many gallons will he have tapped?

23. A man is brushing his farm. He can brush 7/8 acre in one day. If he wants to farm 3½ acres how many days must he brush?

A market woman is selling peanuts. She sells ¼ of her stock to a first customer, ½ the remainder to a second customer, and ¼ of that reminder to a third customer. how much does she have left, expressed as a fraction of her original stock?

25. Euphemia is comparing prices in the store She can get 13 oz. of peanut butter for $1.75 or 28 oz. for $3.50. which is the better buy?

26 She is also looking at cheese. She can buy 6 oz. for $.50 or 18 oz. for $1.30.. Which is the better buy?

27. She sees that sugar is selling for $.80 a lb. or $1.60 a kg. Which is the better buy?

28. A man wants [illegible] cases of Stout and 5 cases of Club for his daughter's wedding. Stout (24 bottles/case) costs 60¢ per bottle and Club (12 bottles/case costs 95¢ per bottle. How much does he need?

29. The mother is preparing Joll of Rice for the ceremony She knows it will take about 1½ cups of rice per person to feed the guests. If she uses 97½ cups of rice to make it, how many people is she expecting?

30. At the ceremony 20 people are palm wine drinkers and 12 are cane juice drinkers The palm wine drinkers each drink 2/3 gallon of that wine and the CJ drinkers each consume two quarts of their favorite How many gallons of country spirits were consumed at the wedding?

31. A farmer builds a fence around his farm. The farm is a 30' by 30' square farm. If he uses one post per foot, how many posts will he use?

32. Tomah has a farm that is 130 feet long and 240 feet wide What is the area of the farm in square feet? In acres?

33. A carpenter is building a table that is 6 ft. long and 4½. wide. What is the area of it in sq. ft.? In sq. yd.?

34. Yakpalo, the carpenter, is building a table that is 35 sq. ft. in area with a length of 7 ft. What is its width?

35. He is also making some benches. Two are to be the same size and the third must be one foot longer than the other two. If he has an 8 ft. plank for the bench tops, how should he cut the plank?

36.. An 11 ft board must be cut into three pieces. Two pieces must be the same size and the third must be two feet longer than either of the other two. How long will each piece be?

37.. Sali is building a round house with a diameter of 15 ft. What will be the area of the inside? (use =3.14)

38. Cassava is $.50 for a bunch of 6. If you have $3.00 how much cassava can you get?

39. You can make 28 blocks with one bag of cement. If you need 784 blocks, how many bags of cement must you get?

40. Blocks cost $.50 for one block. If you need 28 blocks, how much will they cost?

41. Three plantain cost 20¢. If you have $1.40, how much plantain can you get?

42. It is 71 miles from Kahnwiake to Tchien. If a moneybus makes the trip using 6 gal. of gas what is its mileage per gallon (MPG)?

43 It is 45 miles from Bomi Hills to Monrovia. If a moneybus uses 3½ gals. on the trip what is its MPG?

44. It is 18 miles from Harper to Pleebo. If a moneybus gets 10 MPG, how many gallons will it use to make the trip?

Tom Walsh. PCV Harper

A three step method for instruction

1 Gather data: give a pretest to find out where the student is now

2 Prepare specific instruction: this is to bring tke student up to desired standards

3. Evaluation. this will insure that the student has actually learned what you intended. A posttest can be used.

A diagram of the instructional process

Skill #1	pretest	instruction	posttest
Skill #2	pretest	instruction	posttest

The skills taught should be realistic and relevant for the student. Lessons should be prepared so that they start simple and spiral toward the complex. This will allow repetition and reinforcement.

An immense amount of initial work will have to be done by the teacher. Paper for tests and record keeping are necessary but alternatives like cassette recorders overhead projectors and whatever else you can think of, can be used.

My experiences have been interesting. This program was originally planned for twelfth grade. I taught five sections my first year and got a basic idea on improvements for the next year classes. It turned out that I had to teach eighth and nineth grade this year. After some major alterations in problems and instructional content I waited for one period and started the program. Simply, I made every pretest too hard. No one could pass them. I abandoned the project until I covered the things I wanted covered matched these with student abilities.

This whole approach is rather new to students and discipline has to be developed. I believe a positive attitude will develop about mathematics when the student accepts some responsibility for learning it and when a teacher helps guide this process.

......../3

Below are some thoughts which might be useful when you are ready to present an actual lesson.

- try to be flexible
- prepare a folder for each student that includes charts for tests scores and other pertinent information
- know what you want from the student and what is possible, then find a way to achieve your goals

Here are a few areas that might help you accomplish your instructional goals.

1. attention - get the student to focus on the details mentally and physically, that are important to **master** the skills
2. presentation - this is where you actually teach, there are three basic ways to do this.
    a. TELLING
    b. SELF GENERALIZATION
    c. MODELING
3. response - your **goal** is to get the correct response, the way you ask questions and make statements is extremely important
4. reinforcement - **reward** is one way to reinforce correct responses moving from a low-level reward is like candy and money, through touch and movement, to a higher-level reward like verbal praise or a smile or nod, no matter what reward you give, it must follow right after the correct response
5. practice - put simply "practice makes perfect" use games, puzzles, quizzes and other methodsto review material covered
6. application - the ability to use effectively the skills learned,is the true test of mastery;a mixture of the abstract and practical can be balanced to provide relevant exercises

A final Word

You might question the usefulness of these ideas. This program may not be realistic for your particular needs. My intent was to design a program that met the needs of high school students in a specific area with specific needs. There are limits to what can be accomplished in a given situation, but to find or establish these limits is an important part of the total process.

Ronald Adams, PCV
Voinjama, Lofa County
LIBERIA
July, 1980

Preparing Students for the National Exam in Mathematics

Building your students' confidence through an understanding of the nature of the exam, and through an exposure to specific, sometimes-overlooked techniques which can be used in the solving of certain types of exam problems:-

Teachers of 9th and 12 th grade mathematics in Liberia are usually faced with the problem of reconciling the need to present material at the appropriate level for their students with the need to provide enough preparation for the broad range of questions found on the national examination. As it is nearly impossible to cover all of the material which is found on the national exam, it is to the teacher's advantage if he/she can give his/her students some techniques for approaching and solving national-exam problems which involve not so much the ability to solve the specific problem completely as an understanding of the nature of a multiple-choice test. Estimation, elimination of "bad" answers, and substitution are some of these techniques.

Students need to approach the national exam with the right attitude. It is an important exam. However, its difficulty and length (and often their realization that they don't know all of the material which appears on it) need not frighten the students to the point where they "choke". The teacher, in addition to reviewing the mathematical principles, concepts, formulas, and operations can spend some time with the students showing how some questions can be answered correctly without having a complete knowledge of the math which is involved. It is the purpose of this outline/discussion to encourage teachers of math to explain to their students as a secondary form of review some additional problem-solving techniques which are unique to the multiple-choice type of exam, and which may, in addition to increasing confidence, increase the ability to use logical thinking.

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Note: The problems which I have used as examples in the next section are taken from the '77, '78, and '79 Junior High Mathematics Exams. The "easy" solution which follows each example is my own, and many times may be the result of only one of the two or three possible approaches, each approach being equally reasonable

I. Understanding the nature of the exam

A. The exam consists entirely of multiple choice questions

B. There are questions which the students will not likelu be able to answer. The student should expect to see some of these questions

C. One of the four choices for each question is correct. After elimination, many times only two (and sometimes only one) choice will remain

D. Each question carries the same weight therefore no problems should be left out due to the spending of too much time on the more difficult ones. There may be "easy problems located near the end of the exam.

II. Illustrating how a good dose of common sense can go a long way in the solving of some problems.

A. "Does not need to be answered completely", or "getting yourself in the right football stadium"

1 If 1 inch on a map represents 12 miles, what length will 3¼ inches represent?

A. 12 miles C. [illegible] miles

B. 15¼ miles D. 39 miles

Disregarding the ¼, and multiplying 3 by 12 gives an approximate answer of 36 is letter "D". The ability to multiply a fraction by a whole number or to convert a mixed number to an improper fraction is not necessary in order to choose "D" as the correct answer.

2. Divide $-21\,x^{3}y^{5}z^{2}$ by $-3\,x\,y^{2}z$

A. $7\,x^{2}y^{3}z$ B. $63\,x^{4}y^{7}z^{3}$

C. $-7\,x\,y^{3}z^{2}$ D. $-$[illegible] x^{2} [illegible]

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When -21 is divided by -3, the coefficient of the entire quotient becomes a positive 7 (+7). At this point in the solving of the problem, a quick look at the possible answers, A-D, shows that only choice "A" contains a coefficient of +7. Without proceeding further, the correct answer is known.

B. "Narrowing the number of choices down by common sense".

1. A barrel of palm oil will last 15 weeks if 1½ bottles of it are used each day. How many weeks will the same quantity of palm oil last if 2½ bottles are used each day?

A. 63 weeks
B. 25 weeks
C. 9 weeks
D. 3 3/4 weeks

If the amount of palm oil used each day is increased the number of days that it will last has to decrease. Choices C and D are the only possible choices as they are less than 15. At this point, unless the student knows a method for actually finding the answer, it's time to make a guess. (The answer is "C")

C. "Common sense eliminates all but the correct answer"

1. Peter can cut a lawn in 2 hours and John can cut the same lawn in 4 hours. If both of them are working together, how long will they take to cut the lawn?

A. 1 hour 20 minutes
B. 2 hours
C. 3 hours
D. 6 hours

If Peter can cut the lawn by himself in 2 hours, then if someone helps him the job will have to take less than 2 hours. Choice "A" is the only one that is less than 2 hours.

2. What are the prime factors of 450?

A. 2,5,77
B. 2,35
C. 2,3,5 5,9
D. 2,3,3,5,5

The only choice which contains only prime numbers is choice "D". It must be correct.

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3. If it takes 9 men 15 days to complete a job, how long would it take 5 men to do the same job?

A. 27 days
C. 4 4/5 days
B. 8 1/3 days
D. 3 days

If you decrease the number of men doing the job, it will take longer than 15 days to complete. The only possible choice is "A".

D. "Getting the answer" by estimating, or by solving only part of the problem"

1. .525 x 1.02 is

A. .5355
C. 53.55
B. 5.355
D. 535.5

1.02 is so close in value to 1 that, in this problem, we are essentially multiplying .525 by 1. Expecting the exact answer to be very close to .525, we choose "A".

2. Add together 6.7, 18, 903.2, and 0.08

A. 912.5
C. 954.0
B. 927.98
D. 972.0

Adding together only the whole-number part of the numberals gives a sum of 927. Choice "B" is the only one which is close to 927. Also, only one of the four numberals has a digit in the hundredths place, meaning that the digit will appear unchanged in the answer. The only answer containing an "8" in the hungredths place is "B".

E. Spotting Principles (or Properties)

In the following two examples, the alert student may see that a principle is being illustrated. Once the principle is spotted, the problem begins to look quite simple. (Nothing more will be said about these two)

1. Simplify: (2/3 - 1/7) ÷ (2/3 - 1/7)

A. 11/21
C. 11/42
B. 1
D. 8/21

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2 Find n if 6(3+2) = 6x3+6xn

A. 12 C. 2

B. 6 D. 1/3

F. "Subsituting each of the four choices for the variable, or seeing which of the four choices satisfies the conditions of the problem".

In each of the following three examples, the student can find the correct answer by using each of the four choices given (see IC) Admittedly, this can be a time-consuming process. However, if the student has looked through the exam and has completed all of those problems with which he/she feels comfortable, I advise him/her to go back and do these substitution-type problems. (Many students forget that one of these four choices that they are looking at is correct).

1. If 15-3x = 6. what is the value of x?

A. 3 C. 7

B. 5 D. 9

2. Solve for x: 5x/3+13= 7x/3+15

A. 7 C. ½

B. -42 D. -3

3. The number 17,211 is divisible by

A. 3 C. 6

B. 4 D. 11

III. Practice

Spend as much time as you can with your students (without taking too much time away from your regular math class) going over old exam problems. Many problems, either in exact or similar form, appear year after year on the national exam. Whether or not the problems repeat, exposure to national-exam-type problems is always helpful.

Ed McFee, PCV
Shelloe

Finding the HCF (GCF)

This method is applicable to arithmetic as well as algebraic problems. It is useful in finding the HCF of large numbers. An example will illustrate the method:

Example I: What is the HCF of 63 and 105?

Answer:

$$\begin{array}{r}1R42\\ 63\,\overline{)\,105}\\ \underline{63}\\ 42\end{array}\qquad\begin{array}{r}1R21\\ 42\,\overline{)\,63}\\ \underline{42}\\ 21\end{array}\qquad\begin{array}{r}2R0\\ 21\,\overline{)\,42}\\ \underline{42}\\ 0\end{array}$$

There is no remainder hence the HCF is 21

Reasoning:

$$\frac{105}{63}\longrightarrow 105 = 63(1) + 42$$

$$\frac{63}{42}\longrightarrow 63 = 42(1) + 21$$

$$\frac{42}{21}\longrightarrow 42 = 21(2) + 0$$

1. 21 is a factor of 105 because it is a factor of 63 and 42.
2. 21 is a factor of 63 because it is a factor of 42 and itself.
3. 21 is a factor of 42 because it is a factor of itself.
4. 21 is the HCF because it is the largest factor of itself.

Example II: What is the HCF of 391 and 920?

Answer:

$$\begin{array}{r}2R138\\ 391\,\overline{)\,920}\\ \underline{782}\\ 138\end{array}\qquad\begin{array}{r}2R115\\ 138\,\overline{)\,391}\\ \underline{276}\\ 115\end{array}\qquad\begin{array}{r}1R23\\ 115\,\overline{)\,138}\\ \underline{115}\\ 23\end{array}\qquad\begin{array}{r}5R0\\ 23\,\overline{)\,115}\\ \underline{115}\\ 0\end{array}$$

There is no remainder hence the HCF is 23.

By Glenn Baaba
Kolahun

Metric Conversions

Arrange the prefixes as follows:

Kilo	hecto	deka	-	deci	centi	milli
K	h	dk	-	d	c	m

Example I: 15 km = ? mm

Answer: In order to get to milli from kilo, you convert 6 places to the right. Therefore, move the decimal point 6 places to the right:

15 km = 15000000 mm

Example II: 75 cg = ? g

Answer: cg to g is 2 places to the left therefore, 75 cg = .75 g

Example III: 307 hl = ? cl

Answer: hl to cl is 4 places to the right therefore, 307 hl = 3070000 cl

By Glenn Baaba
Kolahun

AN EXERCISE IN GEOMETRIC REASONING

By Jaime Laracuente - PCV - GRAND CESS

TOPIC OF EXERCISE -- GENERAL RULE FOR THE SUM OF THE INTERIOR ANGLES OF A POLYGON OF 'N' SIDES

180(N-2)

Teaching geometry in Liberias schools is usually a difficult task because the students in the past have been subjected to the Rote-Memory method of teaching. The student is not encouraged to develop his or her power of reasoning and the logical process is often compromised. The student is usually not encouraged to think on his own and is unable to enhance his grasp on the subject matter. In my teaching experience moreover, I have had difficulty with students who are unable to generalize after having observed certain patterns. It is therefore necessary to jump these hurdles before any serious geometric learning can be accomplished.

My presentation at the 1980 Education In-Service Meeting at Robertsport involves a simple exercise in geometric reasoning. It is an activity found in most geometry textbooks and adaptable to one's particular classroom setting. I was covering the topic of Polygons to a combined class of eleventh and twelve grades. Specifically, I wanted to teach the general rule for the Sum of the Interior Angles of a Polygon of 'N sides. The simple but very helpful textbook activity uses a chart to help the student actually see a pattern and then hopefully discover the general rule.

The student should first be aware of some polygon basics. The student should understand the meanings of such terms as verticles and diagonals of a polygon. He should also be able to draw a polygon of a given number of sides. However, please be reasonable: A polygon of ten or more sides is not easy to draw, even for the teacher. The teacher must also have covered triangles and the sum of the angles of triangles. Moreover, the student should have a knowledge of basic Algebraic terms, Expressions and Equations.

Now let's proceed with the exercise. Draw a chart similar to the one shown in Figure 1 Write in the indicated headings and allocate time in your lesson to explain clearly the meanings of each of the headings In particular, the student should understand that the second column asks for the number of diagonals that can be drawn from one selected vertex. This idea is crucial to the success of the exercise. Appropriate Polygon figures should be drawn to strengthen the comprehension of this concept.

- Figure 1 -

NUMBER OF SIDES	NUMBER OF DIAGONALS FROM ONE VERTEX	NUMBER OF TOTAL TRIANGLES IN THE POLYGON	SUM OF THE INTERIOR ANGLES OF THE POLYGON
3	0	1	1 x 180
4	1	2	2 x 180
5	2	3	3 x 180
6	3	4	4 x 180
7	4	5	5 x 180
8	5	6	6 x 180
9	?	?	?
10	?	?	?
	?	?	?

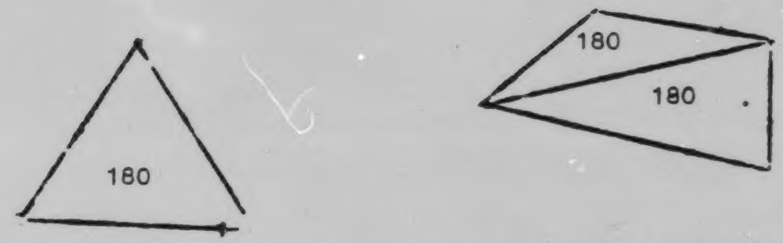
The chart in Figure 1 also shows the date filled in. The student of course will supply the date as he examines each polygon. Start with the simplest Polygon, the Triangle. Have the student actually draw the Polygon on the chalkboard and then fill in the information in the chart for the selected polygon. The teacher may find it necessary to do the first one or two polygons as examples. As each polygon is done the student should draw the diagonals and write the number 180 inside each of the triangles. After several polygons have been examined, the student should hopefully begin to observe certain patterns on the chart. For example, he may observe (with some guidance from the instructor) that the numbers in the second column are three less than the corresponding numbers in the first column. The student may also notice that the numbers in the third column are two less than the number corresponding with the number in the first column. These observations are basic and superficial but are important because they help to prepare the student for the goal you want him to reach. Encourage the student to state to the class what patterns he has observed. Hopefully, the student will make such statements as the number of diagonals drawn from one vertex seems to be three less than the number of sides of the Polygons, or he may observe that number of triangles created by the diagonals is two less than the number of sides of the polygon. Finally the student may see that the sum of the Interior Angles of the polygon appears to be the product of 180 times the number of triangles in the polygon. The next step is to have the student skip one or two polygons in the sequence and fill in the data for a new polygon without drawing the figure. For example, the student may do the first eight polygons with drawings, but then he can be instructed to fill the data for a 9 sided polygon without doing the drawing. Once the student has filled in the data, have him draw the polygon as a self-checking step. This process can be repeated several times but my experience is that the students in general catch on fast.

The next step in this exercise is to have the student apply his knowledge of basic Algebra to formulate the rule for the sum of the Interior Angles. Since this is the purpose of the whole exercise a review of Basic Algebra is advisable if the students are weak in the area. Once the student has seen the rule as suggested by the fourth column, 180(N-2), he should be given the opportunity to test the formula for other polygons. The student should be encouraged to draw the polygons with diagonals. Figure 2 on the final page of this discussion shows several such drawings.

To summarize, this geometric activity has five main steps. First, the students draw the polygons and diagonals and fills in the date in the appropriate columns of the chart. Secondly, after several polygons have been done, the student can be asked what if any patterns he has observed. Thirdly, he can apply his observations to try to fill in the data of a different polygon before drawing it. In the next step, the teacher shoul guide the student in formulating the rule. Finally, he applies the rule for any polygon and checks his result.

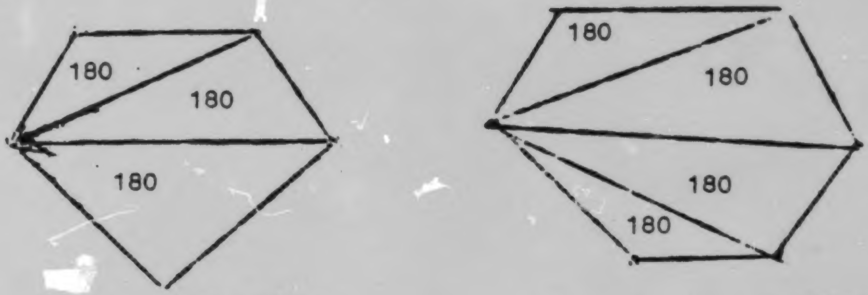
There are two comments that should be made before closing this discussion. Firstly I made an error, I believe, by telling the students before starting the exercise that there was a rule for finding the sum of the Interior Angles of any polygon. The reason is that my students appeared reluctant to formulate the rule on their own. Apparently my [illegible] never had this type of exercise before. I sensed such negative attitudes that I almost decided to forego the exercise. However I stayed with the activity and was successful in converting their reluctance into an active interest in the exercise. My second comment refers to an interesting statement a student made when the class was asked for the number of diagonals that can be drawn from one selected vertex. The student remarked that, obviously, the number of diagonals must always be three less than the number of sides of the polygon. He reasoned and correctedly said that once a vertex is selected, that vertex plus the two non-consecutive vertices are automatically disqualified as vertices to which diagonals can be drawn. It was highly satisfying to have a student reason so well and the hope is that more students can be given the opportunity to strengthen their ability to reason by playing an active role in geometric exercises.

---FIGURE 2-----



N= 3 0 DIAGONALS
1 TRIANGLE

N= 4 1 DIAGONALS
2 TRIANGLES


180
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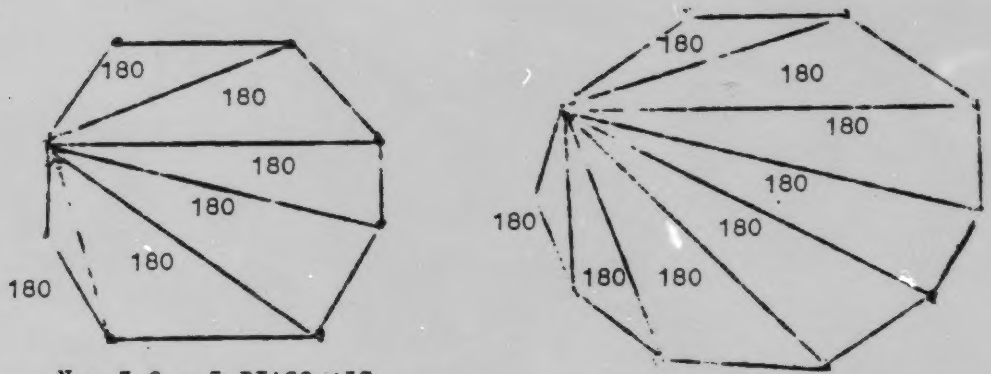
N=5 2 DIAGONALS
3 TRIANGLES

N = 6 3 DIAGONALS
4 TRIANGLES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N = 8 5 DIAGONALS
6 TRIANGLES

N = 10 7 DIAGONALS
8 TRIANGLES

Grading: A Problem of Average

Objectives:

A. Getting students to keep a record of their grades.

B. Teaching the concept of averages.

C. Building addition and division skills and learning how to find percent.

D. Decrease or eliminate the number of arguments concerning grades.

Discussion:

Last year I started the school session by giving an introductory lecture on finding the averages of different things: comparing heights of a number of students, their weights, ages, other factors that lend themselves to patterns which can be interpreted with averages. I tried to present the idea of percent by showing numerically that a person who gets four problems out of five correct will have a score of 80%. By giving many other examples and assigning problems based on actual student grades the concept became more clear.

Next term I will concentrate on finding percents. Changing fractions like 7/8 into an equivalent decimal then to percent, I hope, will help give a better understanding of my grading procedures and provide real problems for practice.

I decided to use each student's own calculation of their grade as a quiz. Those who got the right answers, got extra credit and students with incorrect averages, got less credit.

Chuck Davis

First to Whatever Number - a game

Pick any number, say 53. It becomes the goal. Next choose a range of digits, for instance 1 to 8. One of two players begins by picking a digit from the range. Example; the first player picks 8, then the second player picks 2. 8 and 2 adds to 10. The first player picks again, say 7 and that digit is added to 10, giving 17. The player who reaches the goal 53 wins. Here is a sample game:

	Choice	Sum
1st Player	8	8
2nd Player	2	10
1st Player	7	17
2nd Player	4	21
1st Player	5	26
2nd Player	8	34
1st Player	1	35
2nd Player	3	38
1st Player	6	44
2nd Player	5	49
1st Player	4	53 ←—— The Winner

There is a trick to it. In most case, as with 53 by 1 to 8 above, the player who goes first will win if he knows the right numbers to pick. You can see the "winning sequence" of numbers by adding 1 to the biggest number in the range; in this case 8+1=9. Next subtract 9's from 53. The "winning sequence" for the example is :

53-9=44
44-9=35
35-9=26
26-9=17
17-9= 8

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Or 44, 35, 26, 17, 8. As long as a player picks so his/her number adds to the numbers in this sequence, the player will win. An easier way to use the "winning sequence" is to divide the goal number by 8+1 (or 9), then start with the remainder as the first pick. Example: 53÷9=5 R 8. Pick 8 first. Your next pick plus your opponent's should then add to a total of 9, bringing you to 17, the next number in the sequence. Continue increasing by 9 until you win. Play the game a few times; you will see.

Other goal numbers have other winning sequences but they are found by the same method.. Depending on the range of digits for some goal numbers, the player who picks second is in the winning position. Again, if you can discover how this works.

When presenting the game to students, don't give away the trick. Give them the chance to beat you by discovering the trick. When one does win ask the student to explain how he/she did it.

Bruce McQuade

MATH ANXIETY

Math anxiety is a genuine phenomenon that afflicts may people. Essentially it is a fear, a loss of self-confidence, a nervousness, that occurs whenever a person is expected to perform mathematically. This could be when a person has math homework to do, takes a math test, or makes a household budget. The degree of anxiety may range from something like mild stage fright---butterflies in the stomach--to a profound dread that may actually immobilize a person, keeping him or her from performing at all.

Because math anxiety is sufficiently widespread and can seriously limit a person's ability to function in a society that is increasingly pervaded by mathematics, it is worthwhile to examine what kinds of events induce math anxiety and escalate it and what suggestions teachers could use to minimize it.

During the pre-service training of math and science Volunteers in Frogmore, South Carolina, in January, 1980, a brainstorming session was held to elicit student experiences and teacher attitudes that promulgate math anxiety and to make suggestions for reducing it. Below is a summary of the efforts of these Volunteers.

I. SITUATIONS THAT CONTRIBUTE TO MATH ANXIETY

A. Student Experiences

1. Negative feelings from older siblings, parents, friends, even teachers--about how "hard" math is
2. Pressure from parents and peers to succeed in school--particularly in taking "tough" courses such as math and science
3. Fear of failing or otherwise not being able to measure up in the eyes of one's peers
4. A feeling of helplessness that can be traced to previous failures in other areas besides math
5. Intimidation by the necessity to learn a new language
6. Difficulty in dealing with a system of logic and precision that may be quite different from the logic that a person may have grown up with
7. Incomplete internalization of concepts and processes that are subsequently referred to only by abstract symbols

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8. Intimidation by a lack of understanding of a particular math concept and feeling that he/she is the only one who doesn't understand
9. Intimidation by a teacher--particularly in grade school-- for not being able to do some math problems correctly
10. An inadequate background in fundamental concepts of math upon which understanding of algebra and geometry depend
11. Not knowing where to start in attacking a math problem-- especially word problems
12. Pressure to perform within a given time constraint-especially on tests or blackboard drills

B. Teacher Attitudes

1. Thrill of frightening students by telling them that the subject or topic is going to be "hard"--a teacher ego trip
2. Being intimidating and insensitive to students' fears
3. Inability to get out of the language--i.e. can't seem to express a concept in everyday language
4. Lofty, intellectual; overly serious; inflexible
5. Priority on getting through the syllabus rather than on guararteeing understanding by all students
6. Great emphasis on exams for determining grades rather than on other sources of evaluation information--e.g. class participation, homework, etc.

II. WAYS OF REDUCING MATH ANXIETY

1. Develop a classroom atmosphere of helping rather than one of threat
2. Give positive reinforcement for even the smallest point that is correct
3. Limit negative responses
4. Be sensitive to peer pressure and the identity crises that plague adolescents
5. Don't overemphasize the theoretical nature of math. Keep it relevant to everyday life
6. Individualize instruction (by means of modules) to keep from losing students (both weak and strong)

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7. Make use of peer teaching (but be mindful of Suggestion 4 above)

8 Start a new topic gradually--with easy problems that are broken down into workable and understandable steps

9. Provide an interesting diversity in homework problems and test questions

10. Build confidence on tests by starting with easy questions

11. Make tests short enough for the given time period

By Tom Wheeler

Contents

Science Reading Kit List

Alternate Teaching Methods

How to organize a Science Debate
- Debbie Champagne Bailay

Problems of Discipline in a Small Class

Discipline in Large Classes

Presenting Concepts
- Janice Flahiff

Securing Books for Your School
- Edward Glumac

Supplies Necessary in a Science Lab

Value of Observation Exercises
- Michael Kammerdeiner

Changing Metric Units
- Dave Weinrich

Leaf Collection/Planetarium
- Jean Roden

Emphasize Math
- Deborah Hill

Homemade Ditto Duplicator
- Michal Kristie Mueller

SCIENCE

1980 In - Service, Robertsport

Science was a large, involved and enthusiastic group, sometimes augmented by math and health teachers as well. The diversity of the group added to the vitality of our sessions. The discussions were lively, the presentations helpful and informative. A great deal of credit is due to all who took part.

In addition to the other activities, several individuals wrote questions for for various science readings, thus helping to complete the kit which we hope to have available soon.

A list of the Science Readings and summaries of the presentations and discussions follows.

Michal Mueller

SCIENCE READING KIT LIST

PART I: PHYSICAL SCIENCE

1. Matter:
    1. Atoms and Molecules
    2. Solids, Liquids, and Gases
    3. Boiling Point and Freezing Points
    4. Kinetic Theory of Matter
    5. Solutions
2. Electricity
    1. Conductors and Insulators
    2. Volts, Amps and Ohms*
3. Energy:
    1. Heat
    2. Fire *
    3. Behavior of Light
    4. Sound
    5. Energy today and tomorrow
4. Earth Science:
    1. Types of Rocks*
    2. The Structure of the Earth
    3. Mountains that Smoke *
    4. The Materials and Forces of Nature
5. Weather:
    1. Climates of the World
    2. Our Ocean of Air
    3. Types of Clouds
6. Astronomy:
    1. The Planets
    2. Light Year
    3. Space, the Final Frontier
7. Machines:
    1. Machines *
    2. Mechanical Advantage
    3. Friction
    4. Levers *
    5. The Law of Levers*
    6. Wheel and Axle *

PART II: LIFE SCIENCE

1. Health: 1. Nutrition.The Three Basic Food Groups
   2. Henry the Hookworm
   3. Man against Malaria

2. Botany: 1. Parts of a Plant *
   2. Angiosperms
   3. The Tropical Forest *

3. Man: 1. The Emergence of Man
   2. The Human Body *
   3. The Circulatory System
   4. Human Reproduction

4. Nature: 1. Environmental Science Introduction
   2. Amazons at War
   3. Evidence of Evolution
   4. Man and His Environment: Wildlife Society of Liberia
   5. Man and His Environment: Liberia's Wildlife
   6. Man and His Environment: The Gambia and its Future
   7. Man and His Environment: Full Circle
   8. Habitats of the Spaceship Earth

Alternate Teaching Methods

During a discussion on alternate methods for teaching science quite a few ideas were mentioned including games for practice or review and ways of getting the class more actively involved. Mark Hughes (Kankakee) also gave a demonstration of some tried and true games.

These are included in the list below:

1. Concentration - matching 2 cards from many turned face down. Put words, symbols, definitions on cards.
2. Hangman (or it's opposite)
3. Food chain cards - arrange in order
4. Life Cycle cards - arrange in order
5. Oral Questions - like a spelling bee
6. Scavenger hunt
7. Flash Cards
8. Bingo - can use elements symbols, etc.
9. Dominoes - put a word on one end and a short definition on the other
10. Any regular card game can be played but make a new deck from metric prefixes to teach heirachy of values
11. Crossword puzzles
12. "What is wrong with the picture?"
13. Use analogous stories to illustrate concepts.
14. Word list charts
15. Student presentations (use a timer)
16. Play acting processes or changes of state, etc.

PROPOSED SCIENCE READINGS

Pressure and Temperature

Humidity

Winds

Air Masses

Fronts and Storms

Wedges

Inclined Planes

Ohm's Law

Parallel & Series Circuits

Magnetism

Stars & the Sun

Comets, Meteors, & Asteroids

Water Pressure, Buoyancy (Archimedes' Law)

Air Pressure

IN LIFE SCIENCE

Microorganisms

Growth of Bacteria

Protozons and Bacteria

The Cell: Building Block of Life

How Plants make food

The Digestive Tract

The Nervous System

The Respiratory System

Anyone interested in writing up new readings, from the suggested list above or your own ideas, is encouraged to do so.

Send the readings and accompanying questions in to the office.

HOW TO ORGANIZE SCIENCE DEBATES

I. Choose a topic which is stimulating and lends itself to debate. Also, select something which will broaden the students' knowledge. You may want to conduct your debate after a particular unit of study.

Topics: behavior and the brain, genetics engineering, evolution etc.

II. Formulate the question you debate is on. (Make it such that you have to answer "yes" or "no"):

Examples. Does the brain control so much of human beings' behavior that there is no such thing as free will?

- Is genetic engineering beneficial to mankind?

III. Decide on the number of speakers for each side.

I usually use 5 people on each team: 1 gives the introduction to their side; 3 give supporting evidence; 1 gives the concluding remarks for their side.

IV. Write the speeches for both sides. Being as little biased as possible, compose the students' speeches using good grammar, sentence structure, and a few new vocabulary words (science or other). Develop the sequence of your speeches so that they reach a climax.

V. Go to your class (es) and explain what you want to do. Ask for volunteers. You may announce at this time that these people will receive extra credit, or whatever reward you have decided on. Make it clear that the volunteers have to practice with you at the time (s) or days you want. Choose a good time of the day for your students to practice.

VI. First Practice Session.

Explain very carefully what a debate is and how it is organized. Next, explain the selected topic. Lecture the students and discuss the topic. Ask for questions. Then tell the students that next time they will be asked to choose their side.

VII. Review what you did in the first practice session. Then describe the speeches under each side. Ask the students to choose their speech. Read the speech to each student, explaining its contents thoroughly. Help them with new vocabulary words.

VIII. Subsequent Practice Session.

Make very sure that each speech is understood by each student. Practice the speeches in the correct order. (pro, con, pro, con, etc) Be debate coach and help the students learn public speaking skills while they practice.

IX. Choose the date, time and place of debate.

As you see your debate members pulling together, select the date and time for your debate. Decide on who will be invited to attend. Then find a room large enough to accommodate everybody. You should also choose a panel of judges. Send out invitations in advance.

X. Rebuttals

Decide whether or not your teams could stage a rebuttal. If so, then describe it to the students and how a team may gain more points through it. Then disclose to one person on each team one place for rebuttal on their side.

XI. Day of the Dabate

Arrange the seating for your teams and judges.

Before the debate begins, introduce the purpose of the debate to the audience. Make sure that they understand the question of your topic. You may give an introductory background lecture for the benefit of the guests. Be sure they understand what the "pro" and "con" sides are trying to do.

Introduce each speaker. After the debate, call for the judges' collective votes. Allow one judge to reveal the final vote. Thank everybody for attending.

Problems of Discipline in a Small Class

The problems are numbered and underlined. The possible remedies or reactions are listed below.

1. Spying
Spacing
A & B tests - writing on brown paper, typing cover sheets
nothing on desk except paper
constant observation
Copying homework
group assignments
different assignments (individual)
classwork assignments

2. Late to class
time limit
have students leave
take grades for attendance

3. Talking out of turn
make an issue out of it
make rules and stick to it

4. Interruptions by students & staff
turn away students
be firm with staff - address staff outside of class

5. Joking - step on it or allow it

6. Outside noise
give students something to do
have older students supervise
bring case against absent/present teachers to principal

Try it!

It may be alot of work for you but you may find that: Your students and guests learned about how to hold an organized debate. They all learned more about that particular scientific question. And many may want to know when is the next debate planned and may they participate!

By Debbie Champagne Bailay

Discipline Problem in Large Classes	Solutions
1. Spying	
a. Personal conflict while admitting that a student spied	
b. Casual glancing	- put desk in front of class - make it as difficult as possible for them to cheat - don't make the punishment too severe - one group matched letters to numbers; the other group matched thenumbers to letters -"give me your paper" - be consistent - don't play favorites - your test is finished, you can leave - take paper away for 10 minutes
c. Changing answers after papers are passed back	- put "X" over the wrong part
d. Mass copying	- give different tests - will only count the ones which are different - call out the person's name
2. Late to class	- give pop quiz early to class and don't give it to the late people - sign "stand out - you are late" - you can't enter class after the teacher - "Class time is important" - if you interrupt my class, you can't come in tomorrow.
3. Talking out of turn	- won't teach until they are quiet - stop and look at the student (s) - put student out, 2nd time put them out for a week - say "Catch the door - send them out - "Close the door from the other side" - Walk to the area of talking

7. Militancy and strikes - not a problem in small classes
but it happens, have complaints put in writing and have students go through proper chanels
use School Committee for serious problems

8. Challenge to Authority; not problem with small classes but refer to a source (texts, etc.)
Don't get in conflict (over knowledge) with other teachers

9. Doing other work/reading - take it up

10. Failure to do homework - depends on importance

11. Classroom hogs - (teachers who don't leave at the bell) faculty discussion

13. Settling students palavers
take case to **principal**
settle problem after school

Possible Ways of Securing Books for your School

Sources

1. Ministry of Education - 7th floor - Zoe Caine
    a. Society of Liberian Authors - located behind the Executive Mansion. After getting permission from the Ministry you may sign for as many books as you want.
    b. Peace Corps Office - sometimes used books are donated to the Peace Corps.
    c. Book Donors (Intenational)
    1. Darien Book Plan, Darien Conn. 06820
    2. International Book Project, Inc. 17 Mostelle Park
       Lexington, Kentucky 40502
    d. Family, Friends Schools, (Churches, etc)
    1. Sometimes by writing your friends or parents in the States you can have them send you some books. The Peace Corps will put them in the Diplomatic Pouch if the books are sent to the Washington office, though there are restrictions.
    e. Book Stores
    1. National - corner of Ashmun & Carey Street
    2. Ministry Store - Street level of the Ministry Building.
    3. Captan Book Store (Broad & Randall (2 locations)

Transportation from Monrovia

1. Peace Corps - sometimes you can make use of the mail truck or one of the staff going going on an up-country visit
2. Rural Development Volunteers - make arrangements with one of the RD Volunteers in your area when they are in Monrovia
3. Other possibilities
    a. GSA - NFAA trucks
    b. Air Liberia - school activities fees

By Ed Glumac

4. Staff and Students interrupting	- don't let other students - allow them*to to do it and then talk to individual teacher later after school - sign of respect * the teachers
5. Joking	- make student (s) stand up - everyone, pay attention to so & so - pick up tempo of class
6. Outside noise	-"you are all responsible" - peer pressure - give them the "evileye" - class president writes down names
7. Militancy Students challenge authority	- don't get involved in volatile situations
8. Doing other work/reading	- this is so & so class put that away - circulation
9. Failure to do homework	
10. Class time hogs	
11. Student palavers	- throw out the students

Supplies Necessary in a Science Lab

1. Furniture - Robert Coleman
   Ministry of Education, 7th Floor
   - Have manual Arts teacher make some
   - Make it a class project
2. Glassware - Testtubes, stirring rods, graduate cylinder, tubing, beakers, flasks
3. Hardware - Alcohol burner, thermometer, balance (check Mandingo gold dealers), magnet, lenses, tuning fork, prism (can make from microscope slides & fill with water), dissecting kit, razor blades, pins, wire, flashlight bulbs, paper clips, pulleys, balloons, rubber bands, rubber tubing, weights, snips, file, rubber stoppers, aluminum foil, food cobring, parafin blocks and modelling clay (both Sinkor Supermarket) ping pong balls , clip boards (from ceiling file and clothes pins.)
4. Chemicals - Iron filing, sulphur Iodine HCl,litmus paper, lime

Value of Observation Exercises

1. Student - centered activity
2. Sense of awareness
3. Practice in observation, description and comparison
4. Reading, writing skills developed
5. Inductive reasoning practiced

By Michael Kammerdeiner

CHANGING METRIC UNITS

This is a simple method of changing between metric units (kilometers to centimeters) which allows students to do the operation even if they don't understand the math involved. The emphasis is on moving the decimal point the proper number of units left or right. To determine this, just write the metric prefixes in order, up and down or left to right:

Kilo   Hecto   Deka ——   ——   Deci   Centi   Milli

If you have deciliters and want to convert to killileters, simply count the prefixes "milli" is 2 prefixes to the right of "Deci" so you move the decimal point 2 places to the right.

Examples: 2.5 dl = 250. ml
2.5 dl = .0025 hl

If you count to the right, you move the decimal to the right. And if you count to the left, the decimal is also moved to the left.

By Dave Weinrich

LEAF COLLECTION

A good project for the class.
Have them locate the different types of leaves. Dry and press them between papers under a weighted board. Mount the leaves with glue on paper and identify them.

Planetarium

This is something that could be used year after year. Take a huge box such as one from a refrigerator and make a small door in it. Cover the inside with dark paper or paint. Then paint in the constellations with luminous paint, drawing the lines between stars to make it easier for students to see them.

Once they see it on a small scale it's much easier for them to recognize star groups in the sky.

By Jean Roden

HOMEMADE DITTO DUPLICATOR

The "Recipe"

1 pint Glycerine

4 envelopes Knox gelatin

3 tablespoons sugar

Dissolve the gelatin in 1 cup of cold water. Mix with the glycerine and sugar. Bring to a boil and cook and stir for 7 minutes. Pour into a large (9 x 14") cake pan and bake for 20 minutes at about 300 degrees F. Cool undisturbed 24 hours.

TO USE:

First of all don't prepare your ditto master in the usual way or the copies will come out backwards. Simply take out the tissue as normal then flip it over and write/draw/type on the back, not on the white front side. This may be a bit hard on the eyes as ditto usually have their brand name all over the back, but squint and carry on.

Wet the "Jelly" surface with a sponge using COOL water. Blot excess water with paper towel or toilet tissue. Apply your ditto master face down - one end first and smooth it on to the jelly. Rub slightly. Allow about 30 seconds for the ink to transfer, then remove ditto. Make copies by smoothing on a piece of paper, then removing by pulling up and away from you. When finished, sponge surface immediately using LUKEWARM water until the copy has been erased from the surface.

GOOD LUCK

By Michal Mueller

LNE/SH. 1978

Booklet No. ________

WEST AFRICAN EXAMINATIONS COUNCIL
LIBERIAN NATIONAL EXAMINATION
SENIOR HIGH SCHOOL

LANGUAGE ARTS & SOCIAL STUDIES

GENERAL INSTRUCTIONS

1. THERE ARE TWO TESTS IN THIS BOOKLET. YOU MUST ANSWER ALL THE QUESTIONS IN EACH TEST.
2. THERE IS A SET TIME FOR EACH TEST. YOU MAY ONLY WORK ON THE QUESTIONS OF A PARTICULAR TEST DURING THE TIME ALLOWED FOR THAT TEST. IF YOU FINISH A TEST BEFORE TIME IS UP, CHECK YOUR ANSWERS CAREFULLY. YOU ARE NOT ALLOWED TO START THE NEXT TEST UNTIL YOU ARE TOLD TO DO SO.
3. YOUR ANSWERS MUST BE MARKED IN PENCIL ON THE SEPARATE ANSWER SHEET PROVIDED.
4. FOR EACH ANSWER YOU MARK, MAKE SURE THAT THE NUMBER ON THE ANSWER SHEET AGREES WITH THE QUESTION YOU WISH TO MARK.
5. THERE ARE SEPARATE INSTRUCTIONS AT THE BEGINNING OF EACH TEST. READ THEM CAREFULLY BEFORE ANSWERING THE QUESTIONS.
6. DO ALL YOUR ROUGH WORK IN THE BOOKLET.

C 1978 West African Examinations Council

LANGUAGE ARTS - TEST CODE: 11 **Time Allowed: 2 hours**

You will have 2 hours to work on Language Arts which is divided into seven sections. You are to read the directions for each section carefully and then answer the questions.

Section 1

Directions: In this section, there are five (5) passages, each of which is followed by some questions based on the content of the passage.

Read each passage and the questions carefully, and select the best answer to each question. Then blacken the corresponding space on the answer sheet.

Answer all questions using only information given in the passages. Record your answer on the answer sheet by shading the answer space which bears the same letter as the answer you have chosen.

You are advised NOT to spend more than 50 minutes on this section.

PASSAGE A

It is high time African leaders stopped playing games of individualism when by doing so they will be exploited by the neo-colonialists. It is my view that no European will give back an inch of territory in Southern Africa as long as Africa is divided, and as long as Africa is weak militarily and economically. The only solution to the liberation problem seems to be to continue to fight while at the same time being willing to negotiate from a vantage point.

If we must fight while we negotiate, African countries must keep their commitment to the Liberation Movements. If we are to walk side by side with our brothers in Southern Africa while they fight and negotiate, we must pay our contributions to those Liberation Movements. We must urge our governments to set aside one percent (1%) of our national budget for the Liberation of Africa. My cardinal assumption is that neither fighting nor negotiating should be substituted for one another. These are tools which must be employed against the evils of apartheid in Southern Africa, and against minority rule in Zimbabwe and all other forms of discrimination, in any part of Africa, including those of Namibia. Africa will never really be free until every inch of territory on this great continent shall have sung the song of freedom, and shall have taken control of its economic destiny.

1. The main idea in the passage is

A. the total Liberation of Africa.
B. financial support of Liberation Movements.
C. the role of Liberation Movements.
D. evils of apartheid in Southern Africa.

2. No European will give back any territory as long as

A. there are Liberation Movements.
B. Africans control their own economy.
C. the continent of Africa is not united.
D. the evils of apartheid exist in Southern Africa.

GO ON TO THE NEXT PAGE

3. The author favors
   - A. negotiating rather than fighting.
   - B. fighting rather than negotiating.
   - C. negotiating and fighting together.
   - D. neither negotiating nor fighting.

4. To support Liberation Movements financially, the author suggests that
   - A. governments must tax their citizens.
   - B. governments must provide 1% of the Liberation budget.
   - C. each government must give 1% of its budget to the neo-colonialists.
   - D. each government must give 1% of its budget to the Liberation Movements.

5. Negotiate in the passage means to
   - A. take something by force.
   - B. prolong an important discussion.
   - C. ignore an important discussion.
   - D. discuss so as to reach agreement.

PASSAGE B

A marvelous display of the kind of patience needed by a true scientist was exhibited over a period of some fifteen years by an ichtyclogist named James L.B. Smith. This ichtyclogist (a scientist who studies fish) heard that a remarkable fish had been caught by a fisherman off the South African Coast. From the description of the fish, Smith gathered that it was a coelenterate. But if he were right in his assumption, this would prove to be more than a mere incident in the annals of ichthyology, for the coelenterate had supposedly been extinct for some seventy-five million years.

In expectant excitement, James Smith set out to find the fisherman and his singular catch, but the meeting was more disappointing than joyous. The fish bore all evidence of being truly a coelenterate, but it had taken Smith so long to arrive that by now most of the specimen had rotted away. The skeleton of the fish and the hefty armor which passed for scales served to deepen Smith's sense of having been thwarted by time in his desire to view this marine wonder. He made up his mind that some day he would view a coelenterate whole and intact.

For fifteen years Smith held to his purpose. Up and down the coast of South-east Africa he distributed pamphlets offering a large cash reward for a fresh specimen. His perseverance was rewarded when in January, 1953, the master of a small sailing vessel cabled the news to Smith that another coelenterate had been caught near Madagascar.

A long-held dream was fulfilled when James Smith stood for the first time triumphantly examining the newly caught coelenterate, only slightly damaged because of having been clubbed to death by the fisherman. Five feet long, iridescent blue in color, the monster had blue eyes, a peculiar club-like tail and bulbous fins.

6. James Smith appears to be a man who is NOT
   - A. unusual.
   - B. clever.
   - C. easily excited
   - D. easily discouraged.

GO ON TO THE NEXT PAGE

7. The coelenterate's scales are probably used for

   A. decoration.
   B. protection.
   C. catching food.
   D. swimming.

8. Smith advertised for a coelenterate by the use of

   A. leaflets.
   B. native messengers.
   C. newspaper.
   D. radio.

9. The fact that the fish was clubbed suggests that the fish was

   A. thought to be remarkable.
   B. hard to kill.
   C. very hard to be caught.
   D. caught in shallow water.

10. In this story, the word gathered means

   A. collected.
   B. concluded.
   C. saved.
   D. crowded.

11. The best name for this story is

   A. Patience Rewarded.
   B. The Great Blue Fish.
   C. A Patient Fisherman.
   D. A Prehistoric Monster.

12. The author of this story is trying to be

   A. scientific.
   B. imaginative.
   C. amusing.
   D. informative.

13. In this story, the word singular means

   A. hefty.
   B. one.
   C. separate.
   D. unusual.

PASSAGE C

Gold is a peculiar stuff, a happy marriage between matter and idea. As the ultimate measure of values, this wonderful metal clatters round the globe in an unceasing stream of smoothly finished yellow bars.

As the one time base of our money, and still a pillar of today's international monetary system, gold to most of us becomes almost an abstraction. But gold is also something else — the king of metal and a friend of man. Without it our civilization would not be the same. Its scientific symbol indicative of man's long affair with gold for centuries, was a picture of the sun.

GO ON TO THE NEXT PAGE

Impervious to the ravages of time, not tarnished by air, water and most corrosives, gold bears the imprint of eternity. Gold has been melted down, recast and melted down so long that the ring you buy today may contain gold that once shone in the necklace of the Queen of Sheba. Gold performs in many guises from pen-points to the gold plated "umbilical cord" of space-walking astronauts.

Bright, lustrous and astonishingly heavy, gold is more malleable and ductile than any other metal. Alloyed with other metals to acquire hardness, gold changes its complexion: silver will make it pale, while copper makes it bluish; such fancy shades as green, orange, ruby and purple can thus be obtained.

Today, although no nation uses gold as legal tender, some still mint gold to satisfy the huge demand. People now buy gold coins legally at any bank and they consider them the best insurance against all calamities.

Geologists assure us that, while there is plenty of gold left in the present mines now worked, major new gold strikes are unlikely in the future. But whether gold production falls or rises, demand for gold will ever outrun supply. Man will continue to be fascinated with the yellow metal, as he has been for some 6,000 years.

14. In the passage, the writer's statement that "gold is a marriage between matter and idea" may mean that

A. gold is a mineral shaped by man's mind.
B. gold can be obtained after marriage.
C. gold has some idea in it.
D. a married couple usually get gold as a gift.

15. The phrase "as the one time base of our money" may mean that

A. gold has weight.
B. gold was not popular.
C. gold was the standard of value.
D. gold was of a base metal used for money.

16. Why does the writer think that gold bears the imprint of eternity? Because

A. it is yellow in colour.
B. it does not change or wear out with time.
C. it is stored in vaults in banks.
D. it usually decreases in weight with time.

17. The ring you buy may contain gold that was once used by the Queen of Sheba because

A. it was the Queen of Sheba who discovered gold.
B. all gold was owned by the Queen of Sheba.
C. gold has been melted and remoulded for many years.
D. the bright colour is like that worn by the Queen of Sheba.

18. According to the passage gold is mixed with other metals to make it

A. soft.
B. hard.
C. heavy.
D. smooth.

GO ON TO THE NEXT PAGE

19. The statement "gold as legal tender" may mean that
    - A. it can be used for payment.
    - B. it cannot be used to purchase property.
    - C. it is used mainly for legal purposes.
    - D. lawyers get a lot of gold.

20. Gold may change its complexion
    - A. because of constant usage.
    - B. due to prolonged storage.
    - C. when it is alloyed with other metals.
    - D. when it is polished with a soft cloth.

PASSAGE D

In 1964 the Surgeon General of the United States issued a report on medical research concerning smoking. He warned the public that cigarettes are a serious danger to life and health. Nevertheless, millions of Americans still find cigarettes irresistible, and per capita consumption is going up. The report cited cigarette-smoking as the major cause of lung cancer and chronic bronchitis. Smoking is also an important cause of the cancer of the larynx and is associated with an increased risk of the cancer of the bladder and of the esophagus. It contributes to heart disease, peptic ulcer, cirrhosis of the liver and the smallness of babies at birth.

In the decade since 1964, additional health hazards have been cited.

The anti-smoking movement has brought about the following changes: restrictions of smoking in planes and trains; segregated areas for non-smokers in a growing number of restaurants; segregation of smokers in the military quarters; and legislation either passed or being considered in many cities and states as well as in Congress for prohibition of smoking in public areas.

21. Smoking can cause cancer
    - A. of the lungs and larynx.
    - B. of the liver.
    - C. of the heart.
    - D. in small babies.

22. The article says non-smokers are now being protected by
    - A. a law prohibiting smoking in all the states.
    - B. the isolation of smokers in some areas.
    - C. a law of Congress.
    - D. a frequent medical examination.

23. The article shows that
    - A. the Surgeon General's report was well received by many smokers.
    - B. the Surgeon General's report caused alarm amongst many smokers.
    - C. the anti-smoking movement prohibits smoking in planes.
    - D. the anti-smoking movement is helping non-smokers.

24. The word irresistible as used in this article means
    - A. very tempting.
    - B. too expensive.
    - C. extremely fragrant.
    - D. not healthy.

GO ON TO THE NEXT PAGE

PASSAGE E

Such homely virtues as thrift, hard work, and simplicity appear old-fashioned in these days. So probably we want to remember the career of Benjamin Franklin, a true American. Though he had slight formal education, he became one of the best educated men of his days, for he discovered the simple principle that one learns only what he teaches himself. Most teachers can direct and organize the search for skills and information, but few can inspire. There is no substitute for the drudgery of learning. Franklin learned a trade and began reading inspirational books. He sought self-reliance and expressed thoughts that have interested more than one generation of readers. His essays and his autobiography reveal that his knowledge was useful.

25. This passage suggests that

A. old fashioned virtues should be discarded.
B. most people have the homely virtues.
C. learning needs not be drudgery.
D. anyone who applies himself can get an education.

26. Drudgery in this passage means

A. fatigue.
B. reward.
C. incentive.
D. un-pleasantness.

7. According to the passage, Benjamin Franklin

A. did not want to be educated in a school.
B. was too clever for his teacher.
C. did not have much formal education.
D. believed that schools did not require teachers.

8. Which of the following did NOT contribute to Benjamin Franklin's education?

A. Learning a trade
B. Reading of inspirational books
C. Discovery of the simple principle of self-teaching
D. The thrift of his parents

29. The passage says that not many teachers can

A. work hard enough.
B. teach skills to their pupils.
C. inspire their students.
D. provide useful information.

0. Which of the following qualities is NOT attributed to Benjamin Franklin in the passage?

A. Thrift and hard-work.
B. Simplicity.
C. Self-reliance.
D. Integrity.

GO ON TO THE NEXT PAGE

31. According to the passage, the writer

    A. prefers the values of the past to those of the present.
    B. is angry with the present generation of students.
    C. believes that it is old fashioned to be thrifty and hard-working.
    D. thinks only homely people should be thrifty and simple.

Section II

Directions: Read the following questions 32 - 46, carefully and decide on the correct answers. Record your answer in the usual way.

32. The central theme of the play 'Macbeth' is

    A. enmity between England and Scotland.
    B. border warfare.
    C. the downfall of an ambitious character.
    D. the foolishness of women.

33. 'Sunset and evening star and one clear call for me' is a quotation from

    A. Tennyson's "Crossing the Bar".
    B. Wordsworth's "The Solitary Reaper".
    C. Shakespeare's "As you like it".
    D. Shelly's "Ode to the West Wind".

34. 'Paradise Lost' describes

    A. the fall of man.
    B. a pilgrimage.
    C. the resurrection of the dead.
    D. the end of the world.

35. Jonathan Swift was best known as a

    A. great poet.
    B. famous novelist.
    C. playwright.
    D. fierce satirist.

36. "The evil that men do lives after them; the good is oft interred with their bones" is a quotation from

    A. Elegy in a Country Churchyard.
    B. Julius Caesar.
    C. Hyperion.
    D. Dr. Faustus.

37. The 19th century American writer who wrote the essay, "Civil Disobedience" was

    A. William Bryant.
    B. Philip Freeman.
    C. Ralph Wald Emerson.
    D. David Thoreau.

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38. An elegy is a lyric which

A. expresses hope.
B. commemorates heroism.
C. expresses grief.
D. describes humor in nature.

39. 'Sila Marner' is the story of

A. a prince in disguise.
B. a poor weaver.
C. a soldier.
D. a prominent statesman.

40. Edgar Allen Poe's poetry is noted for its

A. mystery and beauty.
B. lack of rhyme.
C. lack of rhythm.
D. depth of thought.

41. 'The Assyrians came down like a wolf on the fold' is an example of

A. hyperbole.
B. metaphor.
C. personification.
D. simile.

42. A poem that describes the natural life in a rustic setting is

A. an elegy.
B. a pastorial.
C. a satire.
D. a ballad.

43. "The world will little note nor long remember what we say here", is an extract from

A. Washington's farewell address.
B. The Declaration of Independence.
C. Lincoln's Gettysburg Speech.
D. Lincoln's second inaugural address.

44. Anthony's statement in 'Julius Caesar' that Brutus is an honourable man is an example of

A. hyperbole.
B. sarcasm.
C. satire.
D. irony.

45. 'Oh, east is east and west is west, and never the twain shall meet', is a quotation from

A. Rudyard Kipling.
B. Thomas Hardy.
C. Joseph Conrad.
D. Alfred E. Hensman.

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46. "But we loved with a love that was more than love, I and my Annabel Lee" is taken from a poem by

A. Tennyson.
B. Poe
C. Shelley.
D. Longfellow.

Section III

Directions: In each of questions 47 - 51, you are given four words labelled A - D. Three of the words are spelled correctly, and only one is mis-spelled. On your answer sheet, for each question, blacken the space bearing the same letter as the mis-spelled word.

47. A. suspicious
B. courageous
C. spacious
D. vegorous

48. A. physiology
B. biology
C. etomology
D. geology

49. A. volcanic
B. atehletic
C. dramatic
D. apologetic

50. A. penitence
B. innocence
C. elegence
D. indolence

51. A. deformity
B. dexterity
C. scarceity
D. animosity

Section IV

Directions: In each of questions 52 - 91, you are given a sentence which contains a blank space. Under each sentence there are four words or expressions labelled A - D. Choose from the words or expressions the one which best fills the space in the sentence and record your answer in the usual way.

52. If he had gained five more votes, he ..... the election.

A. had won
B. would win
C. will have won
D. would have won

GO ON TO THE NEXT PAGE

53. He had no idea how long ......
    A. has he been asleep
    B. had he been asleep
    C. he had been asleep
    D. he has been asleep

54. The high cost of living has stopped traders ..... goods on credit.
    A. from selling
    B. to sell
    C. to have sold
    D. in selling

55. We changed ..... because he preferred mine and I preferred his.
    A. hat
    B. hats
    C. each other's hat
    D. each other's hats

56. As she looked at her little child dying, she found it impossible to control her ......
    A. emotions
    B. morals
    C. instincts
    D. sentiments

57. She allowed several days to ..... before she sent in her resignation.
    A. diverge
    B. evolve
    C. elapse
    D. emerge

58. I would be pleased if he ......
    A. will come
    B. has come
    C. comes
    D. came

59. The thief never admitted ..... the money.
    A. to steal
    B. have stolen
    C. stealing
    D. to have stolen

60. That was the ..... story I have heard.
    A. more interested
    B. most interesting
    C. interested
    D. more interesting

GO ON TO THE NEXT PAGE

61. There was so much food ..... he couldn't finish it.

A. until
B. which
C. that
D. so

62. They don't have ..... time to waste.

A. so much of
B. more of
C. some
D. a lot of

63. If anyone greets you, it is only polite to return .....

A. his
B. their
C. one's
D. anyone's

64. Alice gave up her house by the noisy market and went to live in a more ..... place.

A. secluded
B. reserved
C. seceded
D. secretive

65. It wasn't he who took my book, it must have been ......

A. somebody
B. another
C. somebody else
D. anybody else

66. Mary will not return to school ..... her father pays her tuition.

A. despite
B. unless
C. notwithstanding
D. nevertheless

67. The teacher made a lot of errors ..... he apologized to the students.

A. which
B. that
C. so that
D. for which

68. We would like to say ....

A. certainty with a few things
B. a certainty with few things
C. things with a few certainty
D. a few things with certainty

69. I don't normally agree with him, but this statement is true .....

A. at a great extent
B. to a great extent
C. in a great extent
D. for a great extent

GO ON TO THE NEXT PAGE

70. He asked for a box of .....

A. four-inch nails
B. four-inches nail
C. four-inch nail
D. four-inches nails

71. They were determined to build their church where the Pagan Shrine originally .....

A. stands
B. stood
C. has been
D. has stood

72. If Mr. Toe had known your address, he ..... to you.

A. will write
B. would have written
C. will be writing
D. would write

73. If only I ..... one hundred dollars yesterday, I would have bought a good used car.

A. had had
B. have had
C. would have had
D. was having

74. "Have you seen Bah this morning? "Yes, I saw him ..... this way a few minutes ago".

A. pass
B. passed
C. to be passing
D. to have passed

75. When the child hurt herself, she ..... her mother for sympathy.

A. looked up
B. expected
C. appealed
D. turned to

76. We were all pleased that the drama turned ..... to be such a great success.

A. in
B. out
C. up
D. on

77. Joyce did not want to be a nurse, but her mother was very .....

A. forceful
B. insistent
C. constant
D. consistent

GO ON TO THE NEXT PAGE

78. Comfort remained cheerful during her illness and never ..... despair.

A. gave up for
B. put up with
C. adhered to
D. gave in to

79. John is the only one of the boys who ..... the news about the new salary scale.

A. haven't heard
B. having heard
C. hasn't heard
D. have heard

80. The students asked their teacher .....

A. if they could go to the dormitory early
B. whether could they go to the dormitory early
C. could they go to the dormitory early
D. they could go to the dormitory early

81. The gift of one million dollars to the Liberation Movement was certainly an act of .....

A. ingenuity
B. generosity
C. hospitality
D. clemency

82. The volunteers said that they were ..... ready to help.

A. quite
B. so
C. rather
D. much

83. The teacher exclaimed, "I have never heard ..... story in all my life".

A. a more ridiculous
B. the more ridiculous
C. more ridiculous
D. most ridiculous

84. The monitor has never been nice to me, ..., he was very rude to the supervisor.

A. yet
B. moreover
C. although
D. nevertheless

85. Alice thinks that both ..... will fail the entrance examination.

A. she and me
B. her and I
C. she and I
D. I and her

GO ON TO THE NEXT PAGE

86. There may be some difficulties ..... the two ideas.

A. to be reconciling
B. in reconciling
C. of reconciling
D. for the reconciling

87. The secretary of the committee thanked the editor for giving them .....

A. the informations
B. an information
C. the information
D. some informations

88. The secretary's car did not start; ....., she was late for work.

A. where-upon
B. despite this
C. consequently
D. nevertheless

89. The defeated teams left the field looking extremely .....

A. decomposed
B. dejected
C. dismantled
D. distorted

90. Our leading teams were not only defeated, but ..... by their opponents.

A. violated
B. humiliated
C. dissolved
D. controlled

91. The fragrance of the lily has ..... the entire house.

A. permeated
B. initiated
C. saturated
D. infiltrated

Section V

Directions: In questions 92 - 101, you are given a sentence containing a word or words which are underlined. Under each sentence there are four words or phrases labelled A - D. Choose the word or phrase which is nearest in meaning to the underlined word or words, and then shade the answer space which bears the same letter as the answer you have chosen. Record your answer in the usual way.

92. His father was hard working but rather clumsy.

A. impatient
B. impenitent
C. awkward
D. untruthful

GO ON TO THE NEXT PAGE

93. My frequent advice failed to induce any change in his behavior.

A. alter
B. cause
C. force
D. inflate

94. Dragons are believed to emit flames of fire on their opponents.

A. exchange
B. inflict
C. send forth
D. burn out

95. The obstinate child refused to leave the room.

A. persistent
B. stubborn
C. dutiful
D. tired

96. Musu's beauty enchanted her professor.

A. captivated
B. interested
C. surprised
D. worried

97. The results of his efforts proved his efficiency.

A. readiness
B. competence
C. initiative
D. enthusiasm

98. How could he tell? I think he must be omniscent.

A. all-powerful
B. all-seeing
C. all-knowing
D. all-present

99. His comment on the novel was a subjective judgment.

A. reasoned
B. personal
C. casual
D. detached

100. He was a sturdy character, but he also possessed a certain measure of flexibility.

A. weakness
B. capability
C. persuasive
D. authoritative

101. His remarks on the subject were not pertinent.

A. admissible
B. relevant
C. persuasive
D. authoritative

GO ON TO THE NEXT PAGE

Section VI

Directions: In questions 102 - 106, you are given a set of sentences. Each sentence is followed by four possible interpretations labelled A - D. Choose the best interpretation for each sentence, and record your answer in the usual way.

102. My uncle Tamba has a very good head for business.
This means that uncle Tamba

A. is the chief executive of his business.
B. would make a successful business man.
C. has advanced very quickly in his job.
D. is the best Mathematician in his firm.

103. On the strength of the report, they decided to wait another hour.
This means that they waited another hour

A. in order to be able to present a better report.
B. because they had definite instructions to that effect.
C. because what they heard made it advisable for them to wait.
D. they hadn't yet got the expected instructions for them to proceed.

104. The manager said that he was by no means unsympathetic to the workers' demands, but that he was quite unable to grant them.

From this we know that the manager thought that the workers demands were

A. reasonable.
B. outrageous.
C. insulting.
D. saddening.

105. If he were to offer me the job, I would never accept it.

From the sentence, it is clear that

A. he has not offered me the job.
B. he has offered me the job already.
C. he is being forced to offer me the job.
D. he would like to offer me the job.

106. Leaders who regularly take unpopular decisions are often thick-skinned.
This means that such leaders

A. often take decisions quickly without careful thought.
B. cannot easily be wounded if attached.
C. are not affected by the criticisms of others.
D. do not know in what ways their decisions affect others.

Section VII

Directions: In questions 107 to 110, you are given a sentence with four possible positions for a comma, marked 1, 2, 3, 4,. Decide in which of these positions a comma is necessary and then choose which of the options labelled A, B, C, D gives the position or positions you have chosen. Record your answer in the usual way.

107. Before you paint$_1$the surface$_2$of course$_3$ should be free of rust$_4$ and dirt.

A. 1 only
B. 2 only
C. 1, 2, and 3
D. 1, 2, 3, and 4

108. Caffeine$_1$ which is present in both tea$_2$ and coffee$_3$ stimulates the heart$_4$ and raises the blood pressure.

A. 1 and 4 only
B. 1 and 3 only
C. 3 and 4 only
D. 1, 2, 3, and 4

109. Touring with Towser'$_1$ a directory published by a dog food company$_2$ lists hotels$_3$ and motels$_4$ which welcome people with dogs.

A. 1 and 4
B. 2 and 3
C. 1, 3, and 4
D. 1, 2, and 4

110. In many countries$_1$ of the world$_2$ only the rich$_3$ can afford cars$_4$ and appliances.

A. 1 only
B. 2 only
C. 1, 2, and 3
D. 2, 3, and 4

STOP: DO NOT TURN THIS PAGE OVER UNTIL YOU ARE TOLD TO DO SO.

SOCIAL STUDIES - Test Code: 12

Time Allowed: 45 Minutes

Directions: In each of the following items, one of the four answers is correct. Read each item carefully and select the correct answer. Shade on your answer sheet, the answer space which bears the same letter.

Use the top part of the answer sheet for this test.

1. Which country in West Africa has the highest annual rainfall?

   A. Liberia
   B. Ghana
   C. Ivory Coast
   D. Sierra Leone

2. The time at Longitude 30° W is 5.00 p.m. Calculate the time at Longitude 150° W.

   A. 7.00 a.m.
   B. 7.00 p.m.
   C. 9.00 a.m.
   D. 9.00 p.m.

3. The West European type of climate is experienced in

   A. British Columbia.
   B. Mainland China.
   C. Algeria.
   D. Quebec.

4. Neap tide occurs when the

   A. solar and lunar tides are formed in the same direction.
   B. solar and lunar tides are formed in the opposite direction.
   C. earth, moon and sun are in the same straight line.
   D. moon is between the sun and earth on the same plane.

5. Which of these is NOT a characteristic feature of wet plains?

   A. They contained high percentage of cultivated land.
   B. The surface facilitates transportation.
   C. They contain sparse and spotty population.
   D. The surface facilitates the growth of trading centers.

6. Which of the following factors least influences population density in the world?

   A. Climate
   B. Relief
   C. Rock structure
   D. Water supply

7. Which of the following places experiences mid-night sun in June?

   A. Japan
   B. Norway
   C. Cuba
   D. Antarctica

8. A mountain formed by the accummulation of molten materials from the interior of the earth is called a

   A. table mountain.
   B. residual mountain.
   C. volcanic mountain.
   D. fold mountain.

9. Which one of the following mountains is NOT found in the eastern part of Africa?

   A. Kilimanjaro
   B. Elgon
   C. Ruwenzori
   D. Atlas

10. Rain is produced when

    A. cool moisture laden air gets warm.
    B. warm moisture laden air gets cold.
    C. lightning strikes the clouds.
    D. warm dry and cold moisture laden air meet.

11. Which of the following statements about lines of latitude is FALSE?

    A. They are parallel to the equator
    B. They are the same distance apart all around the earth
    C. They run together at the North and South Poles
    D. They cross the prime meridian

TURN OVER TO THE NEXT PAGE:-

12. Which of the following African countries is a principal groundnut producing country?
    - A. The Gambia
    - B. Mali
    - C. Nigeria
    - D. Sudan

13. Which of the following rivers flows into the Indian Ocean?
    - A. River Nile
    - B. River Congo
    - C. River Zambezi
    - D. The Orange River

14. A map which shows the elevation of the land is called a _______ map.
    - A. political
    - B. vegetation
    - C. relief
    - D. geological

15. A river which flows into another river is called a
    - A. cape.
    - B. bay.
    - C. canal.
    - D. tributary.

16. If you were travelling Southward from Liberia alone at seacoast of Africa, which ports would you arrive at first?
    - A. Port Harcourt
    - B. Libreville
    - C. Tema
    - D. Luanda

17. Which of the following countries is NOT an exporter of rubber?
    - A. Malaya
    - B. Indonesia
    - C. Argentina
    - D. Liberia

18. Ships sailing from the Atlantic Ocean enter the Mediterranean Sea by way of the
    - A. Straight of Magellan.
    - B. Straight of Gibraltar.
    - C. Suez Canal.
    - D. English Channel.

19. An important contribution of ancient Greece was the
    - A. introduction of Algebra.
    - B. development of philosophy.
    - C. invention of the alphabet.
    - D. abolition of slavery.

20. Which of the following was an important factor in the development of civilization in ancient Egypt?
    - A. Dictatorship of the Pharoahs.
    - B. Conquest of Alexander the great.
    - C. Location of the Nile River.
    - D. The influence of the Persians.

21. In which area of the world did the leading religions of today originate?
    - A. Asia
    - B. North Africa
    - C. North America
    - D. Western Europe

22. The events described in the New Testament took place during
    - A. the Golden Age of Greece.
    - B. the era of the construction of the Pyramids.
    - C. the early years of the Roman Empire.
    - D. the Middle Ages.

23. The Greeks and Romans civilization differed from the earlier civilization of Egypt because
    - A. the Greeks used stones to build their houses.
    - B. the Greeks had some voices in their government.
    - C. the Greek Kings had more power.
    - D. the Greeks had fewer god.

24. Which of the following languages was most generally used in Western Europe during the Middle Ages?
    - A. Italian
    - B. French
    - C. Greek
    - D. Latin

TURN OVER TO THE NEXT PAGE:-

A person famous as an artist, a scientist, and a craftman was

A. Nicolas Copernicus.
B. Leonardo da Vinci.
C. Isaac Newton.
D. John Calvin.

. After the Napoleonic wars, the rulers of Europe united to

A. promote the growth of democracy.

B. protect the people from unjust attack.

C. protect Western Europe from autocratic Russia.

D. oppose liberal ideas.

7. The fundamental causes of the French Revolution were

A. social and economic abuses.

B. attacks on France by her neighbors.

C. communist agitations.

D. attempts of the nobility to limit the kings power.

8. An important reason for the interest of the Western powers in China during the 19th century was that China

A. had a large supply of oil.

B. was a good market for farm machinery.

C. served as an outlet for Europe's surplus population.

D. offered opportunities for profitable trade.

29. Great Britain secured power over the Suez Canal by

A. acquiring it through negotiation.

B. seizing it from Egypt.

C. buying the controlling shares of stock.

D. capturing it in World War I

30. The Western European Union can BEST be described as

A. a specialized agency of the United Nations.

B. an international labor organization.

C. a communication corporation.

D. a plan for military cooperation.

31. The best safeguard against the H-Bomb is

A. evacuation of large cities.

B. international inspection and control.

C. expansion of the radar network.

D. more civilian defence drill.

32. The special agencies of the United Nations raise their funds mainly by

A. selling stamps, tracts and cards.

B. charging for their services.

C. collecting tax on exports.

D. receiving contributions from member nations.

33. The non-permanent members of the Security Council are elected by

A. the international court of Justice.

B. the permanent members.

C. the representatives of the secretariat.

D. the General Assembly.

34. Which of the following agencies of the United Nations seeks to promote cultural cooperation and better understanding among nations?

A. UNICEF
B. Security Council
C. Trusteeship Council
D. UNESCO

35. "Too much money chasing too few goods", This economic situation is called

A. recession.
B. depression.
C. inflation.
D. boom.

TURN OVER TO THE NEXT PAGE:-

36. A nation which gives support to neither side in a controversy is said to be

A. a neutral nation.
B. a belligerent nation.
C. a puppet state.
D. an allied nation.

37. Which group correctly pairs a nation with a leading person in the development of its nationalism?

A. France - Prince Henry the Navigator
B. Nigeria - Nkrumah
C. Italy - Cavour
D. Spain - Charlemagne

38. Nationalism may best be defined as

A. the desire to rule over other people.
B. the awaking of people's interest in their country.
C. the respect for law and order.
D. the willingness to use force to gain ends.

39. British control of South Africa was actively promoted by

A. Robert Clive.
B. William Wilberforce.
C. David Livingstone.
D. Cecil Rhodes.

40. In ancient Egypt "Shadoof" was used as

A. a tomb for ordinary people.
B. a means of irregation.
C. a pen.
D. a measure of the height of pyramids.

41. The famous Emperor of Melle (Mali) who made a pilgrimage to Mecca and carried much gold with him was

A. Mansa Musa.
B. Ashia Mohamed I.
C. Sundiata.
D. Sakum.

42. Which of the following Empires came after the ancient Ghana Empire?

A. Ashanti
B. Songhai
C. Benin
D. Mali

43. Which of these ancient kingdoms was located in Nigeria?

A. Songhai
B. Mali
C. Benin
D. Dahomey

44. The ancient Empires of Egypt and Assyria were ruled by

A. Kings.
B. Emperors.
C. Chiefs.
D. Czars.

45. The first British colony in West Africa to gain independence was

A. Nigeria.
B. Sierra Leone.
C. Ghana.
D. The Gambia.

46. The first Europeans to come to West Africa were the

A. Portuguese.
B. Spaniards.
C. English.
D. Dutch.

47. Which one of the following European nations did not participate in the partitioning of West Africa?

A. Britain
B. France
C. Germany
D. Norway

48. Which of the following was NOT a Justice of the Liberian Supreme Court?

A. W. V. S. Tubman Sr.
B. James E. Greene
C. Anthony Barclay
D. H. M. Russell

TURN OVER TO THE NEXT PAGE:-

49. The Liberian Constitution of 1848 was written by

A. Thomas Buchanan.
B. Goodloe Harper.
C. Simon Greenleaf.
D. Richard Gurley.

50. The International Commission of Inquiry sent to Liberia in 1926 by the League of Nations came to investigate

A. Liberia's request for a loan.

B. the charge of slave trading against Liberia.

C. the boundary problem between Liberia and French Guinea.

D. the trouble between the colonists and the natives.

51. The amount of money one pays for goods imported into a country is called

A. income tax.
B. customs duty.
C. excise duty.
D. austerity tax.

52. Which of the following is NOT a factor of production?

A. Land
B. Labor
C. Capital
D. Sports

53. An economic system characterized by a private property is

A. communism.
B. socialism.
C. capitalism.
D. fascism.

54. In Liberia what is the least amount of monthly salary on which income tax is deductable?

A. $75.00
B. $100.00
C. $126.00
D. $157.00

55. In Liberia, the Bureau of Customs comes under the Ministry of

A. Finance.
B. Agriculture.
C. Planning & Economics Affairs.
D. Commerce Trade and Transportation.

56. An appeal from the Clan Chief Courts goes directly to the

A. Paramount Chief's Court
B. Circuit Court.
C. County Commissioner's Court
D. Superintendent's Court.

57. A form of government in which the power to rule is vested in a few is

A. Tyranny.
B. Oligarchy.
C. Aristocracy.
D. Absolute Democracy.

58. The law that deals with the relationship of the individual to the state is the

A. law of equity.
B. private law.
C. public law.
D. civil law.

59. In Liberia, jurisdiction over complaints concerning violations of employees rights is generally held by the

A. Minister of Justice.
B. Minister of Labour.
C. Minister of Local Government.
D. Director of Civil Service.

60. To qualify for a Liberian citizen a foreigner must

A. be of Negro descent.
B. live in Liberia for a period of three years.
C. have a profitable business in Liberia.
D. have deposited $10,000.00 in a bank in Liberia.

THIS IS THE END OF THE EXAMINATION.

LNE/SH. 1978

Booklet No. __________

-667

WEST AFRICAN EXAMINATIONS COUNCIL

LIBERIAN NATIONAL EXAMINATION

SENIOR HIGH SCHOOL

MATHEMATICS & SCIENCE

GENERAL INSTRUCTIONS

1. THERE ARE TWO TESTS IN THIS BOOKLET. YOU MUST ANSWER ALL THE QUESTIONS IN EACH TEST.

2. THERE IS A SET TIME FOR EACH TEST. YOU MAY ONLY WORK ON THE QUESTIONS OF A PARTICULAR TEST DURING THE TIME ALLOWED FOR THAT TEST. IF YOU FINISH A TEST BEFORE TIME IS UP, CHECK YOUR ANSWERS CAREFULLY. YOU ARE NOT ALLOWED TO START THE NEXT TEST UNTIL YOU ARE TOLD TO DO SO.

3. YOUR ANSWERS MUST BE MARKED IN PENCIL ON THE SEPARATE ANSWER SHEET PROVIDED.

4. FOR EACH ANSWER YOU MARK, MAKE SURE THAT THE NUMBER ON THE ANSWER SHEET AGREES WITH THE QUESTION YOU WISH TO MARK.

5. THERE ARE SEPARATE INSTRUCTIONS AT THE BEGINNING OF EACH TEST. READ THEM CAREFULLY BEFORE ANSWERING THE QUESTIONS.

6. DO ALL YOUR ROUGH WORK IN THE BOOKLET.

C 1978 West African Examinations Council

Time Allowed: 1 hr 15 mins

MATHEMATICS - Test Code: 13

Directions: In this test there are 50 questions and each question has four answers labelled A - D. Only one of the answers is correct. Blacken the space bearing the same letter as the correct answer, on your answer sheet. Mathematics is Test 13 so the section of the answer sheet headed Test 13 should be used.

✓1. Express 432 as a numeral in base seven.

A. 4324_{seven}

B. 4424_{seven}

C. 2924_{seven}

D. 1155_{seven}

2. Simplify: $\sqrt{18} - \sqrt{72} + \sqrt{50}$

A. $\sqrt{2}$

B. $-\sqrt{2}$

C. $-2\sqrt{2}$

D. $2\sqrt{2}$

3. What is the square root of 0.001296?

A. 0.36
B. 0.036
C. 0.0036
D. 0.00036

✓4. A car travelling at an average speed of 50 miles an hour left Monrovia for Kakata; 30 minutes later, another car travelling at an average speed of 55 miles an hour started on the same route to Kakata. How soon will the second car over-take the first?

A. 4 hours
B. 4½ hours
C. 5 hours
D. 5½ hours

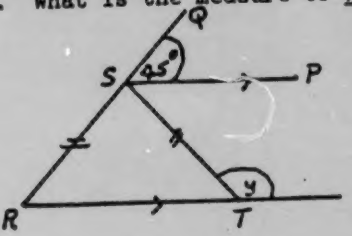
5. Solve for x in $\sqrt{3x-2} = 4$

A. 4
B. 5
C. −6
D. 6

6. If $P(x) = x^3 - 5x - 2$, what is $P(-2)$?

A. 0
B. 4
C. 11
D. 16

7. In the given figure, RST is an isosceles triangle, SP//RT and $\angle PSQ = 45°$. What is the measure of $\angle y$?



A. 35°

B. 45°

C. 65°

D. 135°

8. Rationalize the denominator of $\left(\frac{3}{\sqrt{5}-\sqrt{2}}\right)$ and simplify.

A. $3(\sqrt{5}-\sqrt{2})$

B. $(\sqrt{5}+\sqrt{2})$

C. $\sqrt{3}$

D. 1

9. The area of $\triangle XYZ$ is 6.25 sq.in., and the height XT = 2.5 in. Calculate YZ

A. 2.5 in
B. 3.75 in
C. 5 in
D. 6.5 in

10. If $\tan x = \frac{4}{3}$, what is the value of $\sin x + \cos x$?

A. $\frac{7}{3}$ C. $\frac{7}{9}$

B. $\frac{7}{5}$ D. $\frac{8}{9}$

GO ON TO THE NEXT PAGE:-

11. What is the slope of the line represented by the equation $2x + 3y = 6$?

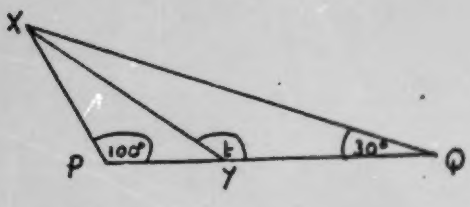
A. $-\frac{2}{3}$

B. $-\frac{3}{2}$

C. -3

D. 3

✓12. In the given figure, $\angle P = 100^\circ$ $\angle Q = 30^\circ$ and XY bisects $\angle X$. What is the measure of $\angle t$?



A. 25°

B. 55°

C. 100°

D. 125°

13. Fatu receives 5% commission on all sales. If her commission last month was $122.50, what were her sales for the month?

A. $2,450.00
B. $735.00
C. $612.00
D. $490.00

14. Mr. Flomo invests $240.00 for 3 years and receives $18.00 simple interest. At what rate per cent was the money invested?

A. 4%
B. $3\frac{1}{2}$%
C. $2\frac{1}{2}$%
D. $\frac{2}{5}$%

15. Simplify: $12^0 - 4^{\frac{1}{2}} - \left(\frac{1}{27}\right)^{-\frac{2}{3}}$.

A. -11
B. 1
C. -10
D. 5

16. Which of the following is equivalent to

$(3x^6)^{-2}$?

A. $-9x^{-2}$

B. $\frac{1}{9}x^{-12}$

C. $9x^{-12}$

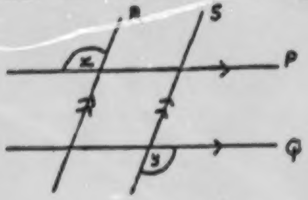
D. $\frac{1}{9}x^4$

17. The map of a rectangular airfield is exactly 6 in long and 2 in wide. If the scale of the map is 1 inch to ½ a mile, what is the area of the airfield in square miles?

A. 3 sq. miles
B. 4 sq. miles
C. 6 sq. miles
D. 8 sq. miles

18. In the given figure P//Q and R//S, $\angle x = 125^\circ$. What is the measure of $\angle y$?

A. 135°
B. 125°
C. 55°
D. 45°

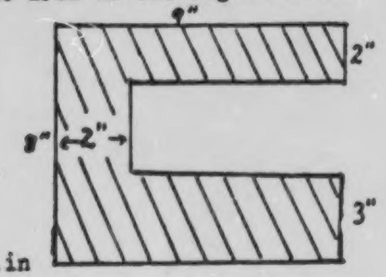


✓19. John can do a piece of work in 3 days and Harry can complete the same work in 2 days. If both work together, how long will it take them to complete the work?

A. 6 days
B. 5 days
C. $1\frac{1}{2}$ days
D. $1\frac{1}{5}$ days

GO ON TO THE NEXT PAGE:-

20. What is the area of the figure below?



A. 72 sq.in
B. 54 sq.in
C. 51 sq.in
D. 49 sq.in

21. Which of the following gives the roots of the equation
$m^2 + 4m - 45 = 0$?

A. 5, -9

B. -5, 9

C. 5, 9

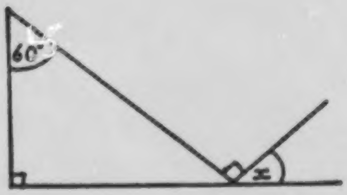
D. -5, -9

22. Solve the pair of equations
$3x - 2y = 7$
and $2x + 5y = -8$
and then find the value of $x + y$.

A. -7
B. -6
C. -1
D. 1

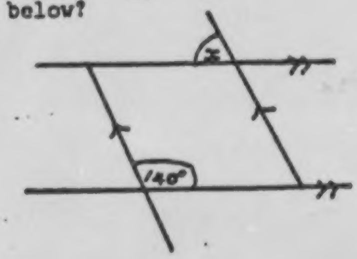
23. Calculate the size of $\angle x$ in the figure below.

A. 30°
B. 45°
C. 50°
D. 60°



24. What is the size of $\angle x$ in the figure below?

A. 30°
B. 40°
C. 60°
D. 80°



25. From the top of a light tower 20 meters high a cargo ship is observed at an angle of depression of 30°. Which of the following gives the distance of the ship from the foot of the light tower? (sine $30° = \frac{1}{2}$, cos. $30° = \frac{\sqrt{3}}{2}$, tan $30° = \frac{1}{\sqrt{3}}$)

A. $20\sqrt{3}$ m

B. $\frac{20}{\sqrt{3}}$ m

C. $\frac{10}{\sqrt{3}}$ m

D. 40 m

26. What is the sum of 5 consecutive even numbers, if x is the smallest?

A. $5x + 10$
B. $5x + 15$
C. $5x + 20$
D. $10x$

✓27. Flomo and Momo entered into a business investment with equal sums of money. According to an agreement between them, Flomo is to receive $4\frac{3}{4}\%$ and Momo $4\frac{1}{2}\%$ of the profit. How much does Flomo receive if Momo receives $180.00?

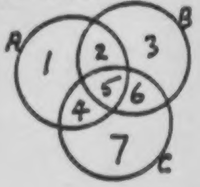
A. $180.00
B. $190.00
C. $200.00
D. $225.00

28. Jarte has $2.25 in dimes and nickles. If he has 3 more nickles than dimes how many nickles has he?

A. 13
B. 14
C. 15
D. 17

29. From the given Venn diagram of sets A,B, and C, what is $A \cap C$?

A. $\{2,4,5\}$
B. $\{4,5,6\}$
C. $\{4,5\}$
D. $\{5,7\}$



GO ON TO THE NEXT PAGE:-

30. Six girls have an average age of 16 years 3 months. When another girl is added to the group, the average age becomes 16 years 4 months. How old is the last girl?

A. 16 years 3 months
B. 16 years 4 months
C. 16 years 5 months
D. 16 years 10 months

31. How many centimeters are there in 1.4 meters?

A. 14 cm
B. .14 cm
C. 140 cm
D. 240 cm

32. The number 0.000126 is equal to

A. 0.126×10^{4}.

B. 1.26×10^{-4}.

C. 126×10^{-4}.

D. 1.26×10^{4}.

33. What is the altitude of an equilateral triangle of side 6 inches?

A. 3 inches

B. 3.5 inches

C. $3\sqrt{3}$ inches

D. 4.3 inches

34. Given that $P = \frac{1}{2}Q(3 + Qx)$, express x in terms of P and Q.

A. $x = \frac{(P - \frac{1}{2}Q) - 3}{Q}$

B. $x = \frac{(2P - 3Q)}{Q^2}$

C. $x = \frac{(P - \frac{1}{2}Q)}{3Q}$

D. $x = \frac{(P - \frac{1}{2}Q)}{(3 + Q)}$

35. If a recipe calls for a mixture of 3 pints of vinegar and 5 pints of oil, how much vinegar will be needed to make 12 pints of the mixture?

A. 4.5 pt
B. 5.5 pt
C. 7.5 pt
D. 8.0 pt

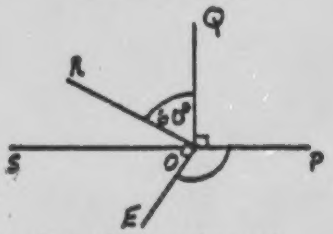
36. In the given figure, SOP is a straight line, QO is perpendicular to SP, RO is perpendicular to EO and $\angle QOR = 60^\circ$. Calculate $\angle EOP$.

A. 90°

B. 110°

C. 120°

D. 180°



37. The sum of the interior angles of a regular polygon is 720°. How many sides had this polygon ?

A. 5
B. 6
C. 8
D. 9

38. A cylindrical kerosine drum has a diameter of 2 feet and a height of 3 feet. Calculate its volume, correct to one decimal place.
(= 3.14)

A. 9.4 cu.ft
B. 9.8 cu.ft
C. 18.8 cu.ft
D. 37.7 cu.ft

39. Twice a certain angle is 12° more than its complement. What is the size of the angle?

A. 26°

B. 34°

C. 64°

D. 56°

GO ON TO THE NEXT PAGE:-

40. If $(6x^2 + 7x - 5) = P(2x-1)$, which of the following is equal to P?

A. $3x + 5$
B. $3x + 3$
C. $3x - 5$
D. $3x - 2$

41. Johnson borrowed $1,200 from a bank at 10% per annum simple interest. How much has he to pay back at the end of 1½ years?

A. $1,212
B. $1,215
C. $1,320
D. $1,380

42. Which of the following points lies on the graph of $2x+y = 10$?

A. (0,8)
B. (3,4)
C. (4,3)
D. (10,0)

43. When a man's salary was increased by $35.00 it became $525.00. What was the increase per cent?

A. $6\frac{1}{4}\%$

B. $6\frac{2}{3}\%$

C. $7\frac{1}{7}\%$

D. 15%

44. Factor completely (a^3-a).

A. $a(a^2-1)$
B. $a(a-1)(a-1)$
C. $a(a+1)(a+1)$
D. $a(a+1)(a-1)$

✓45. If one angle of an octagon is 135°, and the rest of the angles are equal to each other, what is the measure of each of the remaining angles?

A. 135°

B. 145°

C. 155°

D. 165°

46. Simplify: $\frac{a^2-2ab}{a^2b} \div \frac{ab-b^2}{ab^2}$

A. $\frac{a-2b}{a-b}$

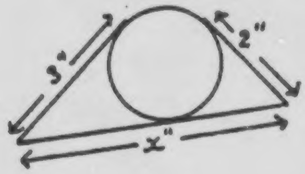
B. $a-2b$

C. $-\frac{1}{a}$

D. $\frac{1-2a}{a}$

47. In the figure, the three lines are tangents to the circle. Calculate the length of x.

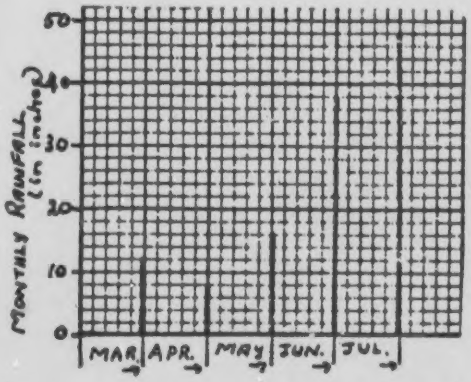
A. 5
B. 6
C. 10
D. 13



48. If $2x - 3 > 7$, then

A. $x = 5$.
B. $x < 5$.
C. $x > 5$.
D. $x. = -5$.

Use the graph below for nos. 49 - 50. The graph represents the rainfall for a certain town for the period March - July.



49. What was the height of the rainfall in May?

A. 8 in.
B. 13 in.
C. 16 in.
D. 18 in.

GO ON TO THE NEXT PAGE:-

50. Express the ratio of the lowest to the highest rainfall, in its simplest form.

A. 1 : 50
B. 1 : 6
C. 4 : 24
D. 4 : 25

DO NOT TURN OVER UNTIL YOU ARE TOLD
TO DO SO

SCIENCE - Test Code: 14 **Time Allowed: 1 hour**

Directions: For each question you are given four possible answers labelled A - D. Choose the one that is most correct and blacken the letter of the answer you choose on your answer sheet. Science is Test 14 so you should use the blue printed answer sheet for this test.

1. Dendrites are part of
   A. a nerve cell.
   B. a gland cell.
   C. a muscle cell.
   D. an epithelial cell.

2. Glucose and starch are similar in that both are
   A. reducing sugars
   B. polyscaccharides.
   C. carbohydrates.
   D. monosaccharides.

x 3. An individual that bears two contrasting genes for any trait is
   A. dominant.
   [✓ B.] hybrid.
   C. pure.
   D. recessive.

✱ Biology

4. Pollination is the
   A. fussion of sperm and ova.
   B. release of pollen grains from the filament.
   C. transfer of fruit or seed from one place to another.
   D. transfer of pollen from the stamen to the stigma.

x 5. The flagellum in certain animals and plants is used for
   A. digestion.
   B. reproduction.
   C. excretion.
   [✓ D.] locomotion.

x 6. Mendel is to heredity as Linneaus is to
   A. biogenesis.
   [✓ B.] taxonomy.
   C. symbiosis.
   D. spontaneous generation.

✱ Biology

7. Which of these animals is not a parasite?
   A. Hookworm
   B. Housefly
   C. Plasmodium
   D. Liver Fluke

8. When a peeled potato is kept in salt solution which one of the following processes occurs?
   A. Osmosis
   B. Hydrolysis
   C. Plasmolysis
   D. Turgidity

9. When homozygous green peas are crossed with homozygous yellow peas, the offspring is
   A. homozygous.
   B. haploid.
   C. mutant.
   [✓ D.] heterozygous.

10. Which of the following kind of cells is NOT present in the stem of a palm tree?
   A. Xylem vessels
   B. Epidermal cell
   C. Cambium
   D. Pith

11. Which of the following is NOT a typical characteristic of insects?
   A. Paired wings
   B. Three thoracic segments
   C. Six legs
   D. Paired spiracles

12. Two analogous organs are
   A. gills and lungs.
   B. hands and feet.
   C. stomach and kidneys.
   D. fins and leaves

GO ON TO THE NEXT PAGE:-

13. The excretory organs of the earthworm are

    A. malpighian tubes.
    B. gills.
    C. nephridia.
    D. spiracles.

14. Life on earth will cease to exist without the sun because the sun is

    A. at the center of the universe.
    B. the only source of heat and light.
    C. a luminous body.
    D. the primary source of energy.

15. To get rid of chlorophyll from a leaf one should boil the green leaf in

    A. alcohol.
    B. iodine.
    C. tap water.
    D. vinegar

16. Which of the following is NOT true about seeds? All seeds

    A. require moisture for germination.
    B. bring the cotyledon above the soil during germination.
    C. have some food stored in them.
    D. have cotyledons.

17. The basic function of the mitochrondria in the cells is to

    A. produce genes.
    B. help cell division.
    C. carry on assimilation.
    D. control the release of energy.

18. Which of the following carries oxygenated blood from the lungs to the heart?

    A. Coronary artery
    B. Hepatic artery
    C. Pulmonary artery
    D. Pulmonary vein

19. Homologous organs are similar in

    A. function only.
    B. origin and structure.
    C. origin and function.
    D. origin only.

20. A perfect flower always has

    A. only the pistil.
    B. only the stamen.
    C. stamen and corolla.
    D. stamen and pistil.

21. Color blindness is

    A. a nervous disorder.
    B. caused by environmental factors.
    C. a sex linked character.
    D. caused by hormonal inbalance.

22. Lipase is an enzyme which

    A. changes peptone to amino acid.
    B. splits fats and fatty acids into glycerol.
    C. changes carbohydrates into glucose.
    D. curdles milk.

23. Adventitious roots

    A. have slender branches of nearly equal size.
    B. have large single roots.
    C. are modified for breathing.
    D. arise from stem and leaves.

24. An example of a multiple fruit is

    A. plantain.
    B. pineapple
    C. guava.
    D. lemon.

25. Which of the following is NOT true about amoeba? They

    A. have two layers of cytoplasm.
    B. are a mass of living jelly.
    C. have eyespots.
    D. move by pseudopodia.

26. The ratio of hydrogen and oxygen combining to form water and hydrogen peroxide illustrates the law of

    A. definite proportions.
    B. multiple proportions.
    C. conservation of matter.
    D. combining volumes.

GO ON TO THE NEXT PAGE:-

27. The correct formula for calcium nitrate is

A. $2CaNO_3$.
B. $Ca(NO_3)_3$.
C. $2Ca(NO_3)_2$.
[✓ D.] $Ca(NO_3)_2$.

28. The use of soap to wash away grease illustrates the formation of

A. a hydrosol.
B. an aerosol.
C. a gel.
D. an emulsion.

29. Carbon dioxide is identified by its reaction with

A. calcium hydroxide.
B. hydrochloric acid.
C. magnesium.
D. sodium carbonate.

30. What is the valency of sulfate in ammonium sulfate?

A. 4
B. -3
C. 2
D. -2

31. Bleaching powder is effective as a disinfectant because it contains

A. calcium.
B. oxygen.
C. chloride ions.
D. hypochlorite ions.

32. When zinc reacts with dilute sulfuric acid, the salt that is formed

A. dissolves.
B. decomposes.
C. vaporizes.
D. precipitates.

33. Elements with the same atomic number but different atomic mass are

chem

A. isomers.
[✓ B.] isotopes.
C. isobars.
D. allotropes.

34. The oxidation number of nitrogen in 'laughing gas' is

A. +1
B. +2
C. +3
D. +4

35. When a metallic iron becomes a neutral atom it is said to be

A. oxidized.
B. reduced.
C. sublimed.
D. dissolved.

36. A gas has a volume of 300 cm^3 at 250 mm pressure. What pressure will be needed to reduce the volume to 75 cm^3 temperature being constant?

A. 100 cm^3
B. 1000 cm^3
C. 1200 cm^3
D. 2250 cm^3

37. Epsom salt is used im medicine as

A. an antibiotic
B. anesthetic.
C. a laxative.
D. a sedative.

38. The basic test for Carbon dioxide gas is to test it with

A. hydrochloric acid solution.
B. sulfuric acid solution.
C. lime water.
D. phenolphthalein.

39. When electrons of one atom are transferred to the outer shell of other atoms the bond that results is

A. covalent bonding.
B. electrovalent bonding.
C. coordinate bonding.
D. hydrogen bond.

40. A compound contains 75% carbon and 25% hydrogen. What is its empirical formula? (C = 12, H = 1)

A. C_2H_6
B. CH_3
C. CH_4
D. CH_2

GO ON TO THE NEXT PAGE:-

41. What is the percentage composition of sulfur in $CaSO_4$?
[Ca=40, C=12, S=32, O=16]

[✓ A.] 23.5
B. 34.0
C. 36.0
D. 64.6

42. The chemical name of NH_4NO_2 is

A. ammonium nitrite.
B. ammonia.
C. ammonium nitrate.
D. nitrous ammonia.

43. What gas is evolved when hydrochloric acid reacts with iron?

A. Chlorine
B. Nitrogen
C. Hydrogen
D. Oxygen

44. Chlorine can be prepared in the laboratory by the action of hydrochloric acid on HCl +

A. $NaCl$.
B. MnO_2.
C. H_2O_2.
D. Na_2SO_4.

45. Nitrates are widely used as

A. antiseptic.
B. bleaching agent.
C. fertilizer.
D. refrigerant.

46. For two objects to be in resonance, they must have the same

A. length.
B. mass.
C. frequency.
D. velocity.

47. The rate of motion in a particular direction is referred to as

A. beam.
B. shade.
C. acceleration.
D. displacement.

48. Rays parallel to the principal axis of a convex mirror appear to

A. pass undeflected.
B. converge toward the principal focus.
C. diverge from the principal focus.
D. be absorbed.

49. Heat reaches the earth by a process called

A. conduction.
B. convection.
[✓ C.] radiation.
D. reduction.

50. If a body is dropped from the pinacle of a church, what distance will it fall in half a second?

A. 32 ft.
B. 8 ft.
C. 16 ft.
D. 4 ft.

51. Convex mirrors are preferred to plane mirrors as driving mirrors because convex mirrors

A. give magnified images.
B. are more durable.
C. give a wider field of view.
D. produce brighter images.

52. Which of the following is NOT a common property of a wave?

A. Rectilinear propagation
B. Amplitude
C. Reflection
D. Refraction

53. A boy 5.0 feet tall stands 20 inches from a small pinhole camera. If the camera is 6.0 inches deep, the boy's image is approximately

A. 24 inches.
B. 16 inches.
C. 8.5 inches.
D. 1.5 inches.

54. The real image is always

A. larger than the object.
B. smaller than the object.
C. inverted.
D. reverted.

GO ON TO THE NEXT PAGE:-

55. What mass of water is contained in a tin can 8 cm by 4.5 cm by 3.5 cm?

A. 126 cm^3
B. 126 gm
C. 1000 lb.
D. 1024 lb.

56. Which one of the following statements is NOT true about sound?

A. Sound waves are longitudinal.
B. Musical notes have definite pitches.
C. The range of audible frequency of man changes with age.
D. Sounds of all frequencies travel with the same velocity.

57. Three lamps of 20 ohms, 30 ohms and 60 ohms are connected in parallel to a 120 volt line. What is the total current in the lamps?

A. 2 ampere
B. 4 ampere
C. 6 ampere
D. 12 ampere

58. Which of these does not involve elasticity?

A. Inflating a balloon.
B. Puncture of a tyre.
C. Drinking with a straw.
D. Weighing with a spring scale.

59. A piece of glass weighs 30.2 gm in air, 18.2 gm in water and 20.6 gm in alcohol. What is the specific gravity of alcohol?

A. 1.2
B. 1.0
C. 0.8
D. 0.6.

60. Which of the following is an example of an internal combustion engine?

A. Automobile engine
B. Reciprocating engine
C. Gas turbine
D. Steam engine

61. Which of the following lenses is used in a magnifier?

A. Convex
B. Concave
C. Cylindrical
D. Plano-concave

62. Lightning during thunderstorms is the result of

A. heat released in the cloud.
B. a sudden electrical discharge from the clouds.
C. the release of solar energy.
D. radiation of electricity through the sky.

63. Which one of the following is NOT true of a curved mirror? It has

A. a center of curvature.
B. a screen.
C. a principal axis.
D. an aperture.

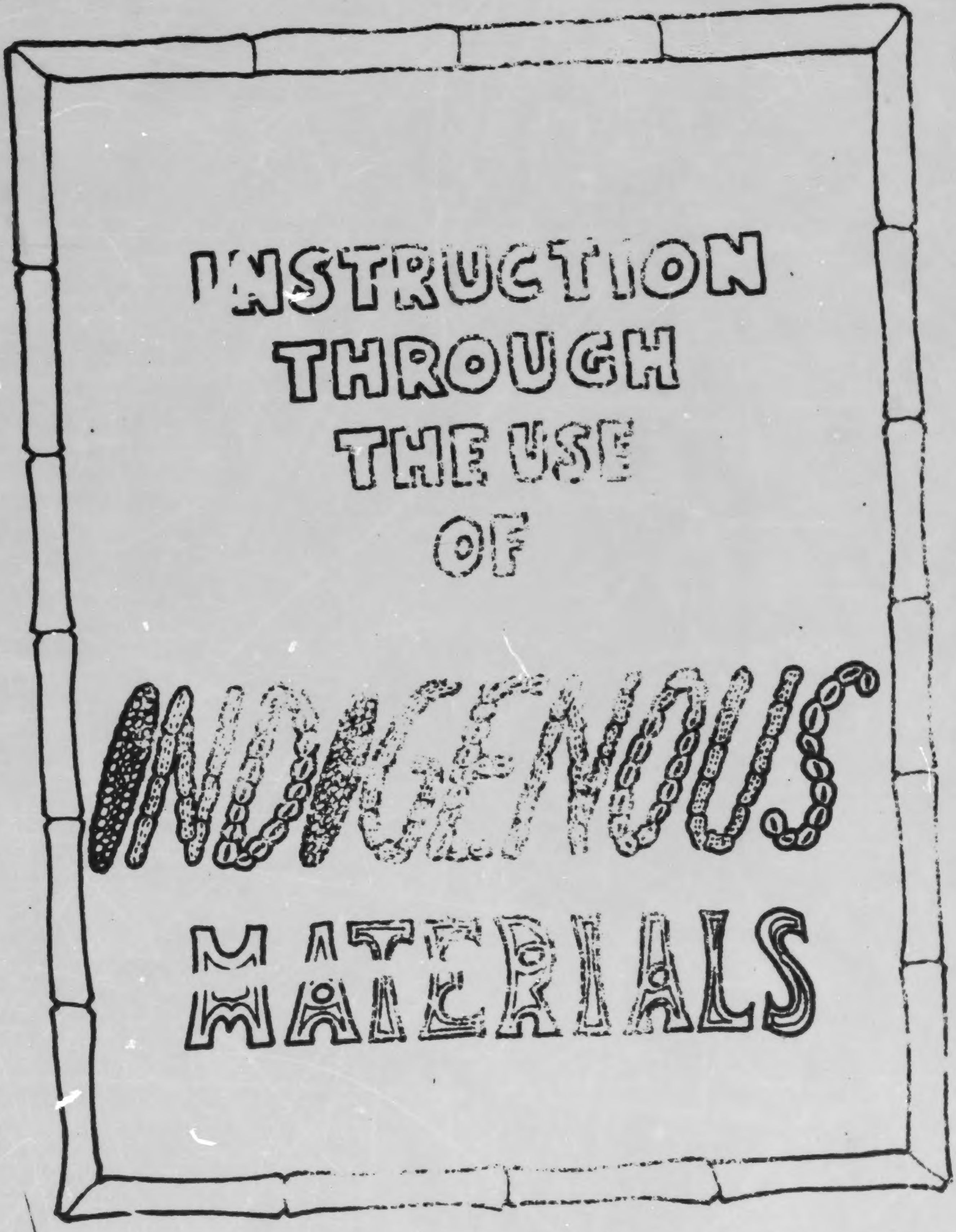
64. Which of the following is NOT a mechanical action?

A. Friction
B. Percussion
C. Combustion
D. Compression

65. The blotting paper uses the principle of the phenomenon of

A. surface tension.
B. osmosis.
C. diffusion.
D. effusion.

THIS IS THE END OF THE EXAMINATION.



INSTRUCTION THROUGH THE USE OF INDIGENOUS MATERIALS

INTRODUCTION --

Teachers say time and time again that they do not have materials to work with in the classroom. "How can we teach?" they ask. Many teachers fail to realize that a room full of new books does not guarantee good teaching nor learning. Teachers oftem do not see the world of indigenous resources around them which provides them with free teaching materials. Good teaching can take place without new books, manufactured materials, and expensive classroom equipment. Every teacher must learn to improvise. He must look at all times for materials which may be waste at the market place, the corner store, the farm, or the home. He can also have his students in the classroom help search for and prepare materials that can be used in the teaching-learning process.

Most teachers in Liberia's rural schools will find that they must develop their own teaching materials and instructional aids because textbooks are scarce. Indigenous materials --- those items native to Liberia suck as raffia, rattan, bamboo, shells, twigs, banana leaves, cassava flour etc are abundant and free. A teacher can plan learning activities for his/her students around the indentification, collection and preparation of the materials that are to be used as instructional aids.

By using indigenous materials, the teacher provides free teaching materials and instructional aids for his/her students. These materials help students learn important concepts, develop an appreciation for Liberia's natural resources, and understand the function and necessity of retaining traditional arts and crafts.

It is small wonder that children are anxious to get outdoors to enjoy the beauty of their world, especially when classroom walls are bare, when their work is not proudly displayed, when seating arrangements are rigid and formal, and the total environment is colorless.

Does this inhibiting environment happen because the teacher thinks of learning only in terms of facts and skills, by rote and memorization, by oral recitation and in other kinds of teacher led activities? Is the acquisition of facts and figures the only objective of education? This kind of learning provides a very small segment of the kind of learning students can best absorb. The teaching-learning act, to be both efficient and effective, demands that students demonstrate comprehension, application, analysis, synthesis and evaluation of the information presented by the teacher. This process requires the active participation, interest, emotionalism, conscious commitment, on the part of the learner as well as on the part of the teacher. Education is not a passive process that focuses solely on the offerings of a dreary textbook and notes in a notebook. The text and the notebook are aids to learning and provide a minimal environment in which to teach and to learn.

The purpose of this booklet is to expand the potentials for learning which, when properly used, will lead to affective learning.

Affective learning concerns the emotions and focuses on the reality of what the learner brings to the classroom---interest, humor, a questioning attitude, inquisitiveness, the love of mystery, the thrill of discovery, enquiry, and kind of commitment which, if used to advantage, makes teaching the most rewarding occupation available. These are the things which education is all about and they contribute to the vital acquisition of attitudes, behaviors, appreciations, interests, understandings, skills, morals, tastes, and standards which, in addition, characterize the educated man.

STUDENTS PARTICIPATION IN THE PREPARATION

All sorts of instructional aids contributes to effective learning. The interest that the preparation of these aids provide encourages students to develop favorable attitudes toward school. It also arouses and sustains interest in learning, motivates students to adopt self-directed activities, and helps to provide the kinds of experiences which lead to a transfer of skills and understanding. Research about teaching and learning shows that instructional aids when properly used enable students to learn more and to remember more for a longer period of time than similar students taught with conventional texts because these students participate in the teaching - learning process - they learn by doing.

Since each student learns best by a variety of teaching methods, teachers must learn to appreciate and use many approaches which are available through use of indigenous materials in the classroom. It is hoped that the ideas presented in this manual will help you to reach more of your students more effectively than ever before. Try to prepare some of these materials and discover what joy teaching can be. Experiment with these suggestions and try to find other materials available for use in making instructional aids. By all means, let the students share in making some of these instructional aids. Good luck in making your classroom a cheerful, colorful, exciting place for learning!

Contributors:

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INSTRUCTION

Through the Use of Indigenous Materials

Revised and Adapted

from

Instructional aids and ideas through of Indigenous
Materials, Curriculum and Materials Center, Department
of Education, Republic of Liberia and U.S.A.I.D.,
August 1967

Kakata Rural Teacher Training Institute
Kakata, Gibi Territory, Republic of Liberia
and
Peace Corps Liberia
August, 1979

THE TEACHING KIT

A TEACHING KIT is a collection of tools that is necessary for good teaching everyday. This KIT is prepared by the teacher before the opening of the school year. Each tool in the KIT is used over and over again by the children and the teacher. A good teacher cannot teach school without his TEACHING KIT ready at all times.

1. Pocket chart
2. Alphabet strip
3. Word pattern cards
4. Collection of pictures
5. Color chart
6. Patterns for drawing (used by the teacher, not the children)
7. Flannel board
8. Phonics cards
9. Numberline (see syllabus)
10. Clock face
11. Calendar
12. Number picture cards or chart 1-10 (grades 1 - 2)
13. Number chart 0-10
14. Number combination cards (see syllabus for combinations)
15. Place value chart (see syllabus)
16. Map of Liberia
17. String, raffia, yarn
18. Pins, pegs, thorns or reeds
19. Paper bags
20. A personal collection of stories, original stories, poems riddles, jingles
21. Geometric shapes
    - Circle
    - Square
    - Rectangle (Large. Cut from cartons.)
    - Triangle

22. Measuring tools
    cup
    pint gallon
    quart
    12" ruler   Both are made from a strip of wood or
    yard stick   reed but the inch marking must be accurate.
23. Marking pen or black crayola
24. Scissors
25. Cassava paste in jars
26. Old newspapers, magazines or catalogues
27. Collection of stones, shells, sticks and seeds.
28. Scarp cardboard, paper or cartons for name cards,
    language arts activities, etc.
29. Games (made by the teacher)
30. Permanent Seatwork (made by the teacher)

BULLETIN BOARDS

With the wealth of indigenous materials here in Liberia, there is no excuse for a teacher not constructing bulletin boards for the individual classroom. Materials that can be used as bulletin boards are:

1. A piece of bamboo or reed matting--the size would depend on wall space.
2. Firm side of a cardboard or light wood crate.
3. Square cardboard pieces from cartons.
4. Labanese paper.
5. Flannel board.

Directions:

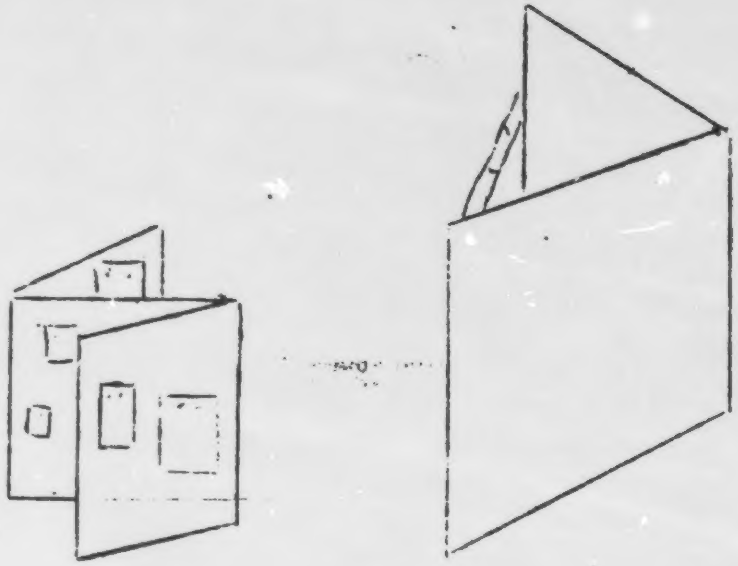
1. Cut the mat, carton or board to the desired size.
2. Paint it if paint is available.
3. If edges of carton or mat are rough, paste paper over the edge using cassava paste, magazine pages or newspapers cut in strips.
4. Tack the bulletin boards to the walls with nails, thorns, reeds or pegs.
5. Always mount your bulletin boards so that the children can reach them and that all mounted materials will be at their eye level.

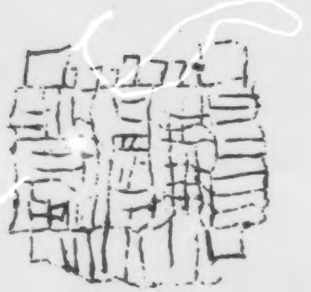
If one of the above mentioned materials is not available, the following suggestions can be used successfully:

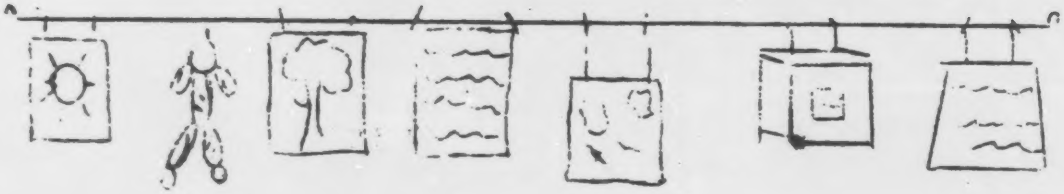
1. Open old rice bags at the sides. Wash and hang. Attach pictures to the open bags with reeds, thorns or pins.
2. Hang a piece of Fanti cloth or an old blanket.
3. Stretch a piece of wire, string or raffia across the room.
4. Place a bamboo pole across the corner of the room. This also makes an excellent chart holder.

Bulletin boards are useful aids in display work, for pictures and student exhibits, etc. Be proud to serve the interests of your students by providing them with a bulletin board to display their own accomplishments and objects in which they are interested. Bulletin boards are as necessary to everyday teaching as the books that are read and discussed. Experts say that what children learn depends on our ability to control the various events that occur in the classroom. Is your classroom conditioned for this learning? What appears on the display areas of the classroom and the arrangement of these materials determine, to a high degree, what motivates children, what is learned, what standards of performance are established, and how interest is created and sustained. Alive, stimulating and well planned bulletin boards make a classroom a place where learning takes place.

Every teacher should feel it his responsibility to erect as many bulletin boards as is possible. Every bit of space that is not occupied with blackboards can be used for bulletin boards. Pictures should never be pasted directly on the walls of the classroom. See illustrations and suggestions that follow:







Stretch a piece of wire, rope or raffia across the room. Hang pictures and crafts with raffia, clothespins or clips.

READING

This bulletin board can feature words, sounds, adventure, places, conversations, books, pictures, puzzles, poems, riddles, jokes, and a great variety of experiences.

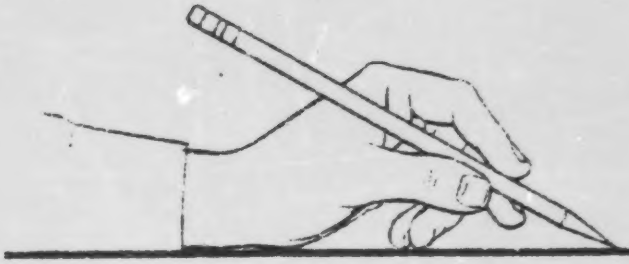
Your reading displays can:

- emphasize good reading habits
- keep a record of all the achievements of the class or group
- stimulate interest in a variety of books through reports, stories, pictures or sketches made by the children
- ask questions, introduce words, and interpret stories
- relate stories to music, art, science, history, and places of interest
- puzzles that match authors or characters to stories and books
- pictures and captions that go together or describe an event
- words organized into family groups by use of word patterns
- problems that ask the pupil to supply the missing words of phases
- questions that can be answered only by further reading
- settings against which children can dramatize their favorite stories
- help to understand more efficient ways to use the dictionary
- and make better use of the library and resources materials.

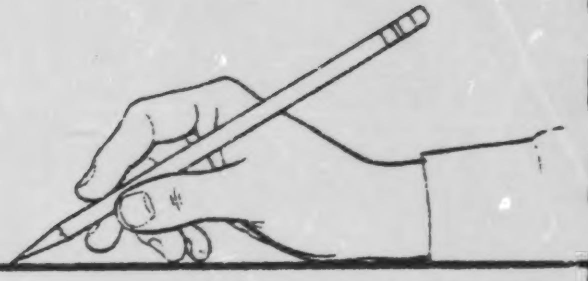
MANUSCRIPT PRINTING

Teachers in the primary grades should spend considerable time on teaching your students correct manuscript printing and cursive writing.

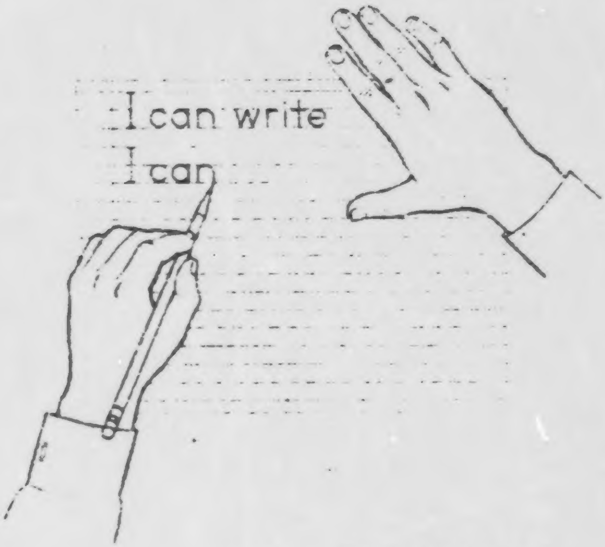
Include in this booklet is a smaple of both styles. Teach your students correct placement of each letter on ruled paper. Let them practice, practice, practice.



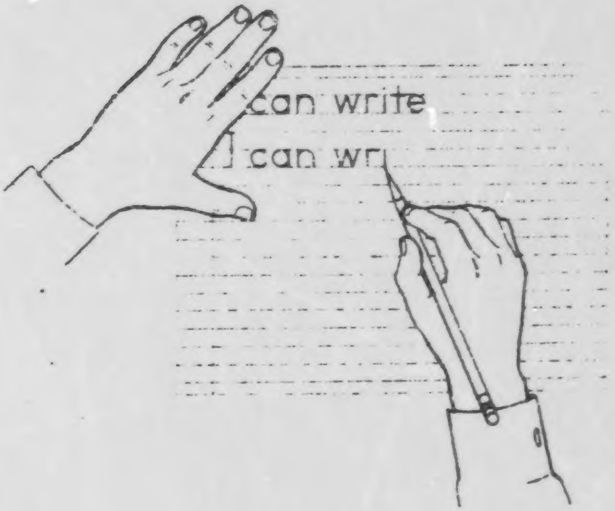
Left-handed writers



Right-handed writers


I can write
I can

Left handed writers


can write
can wr

Right-handed writers

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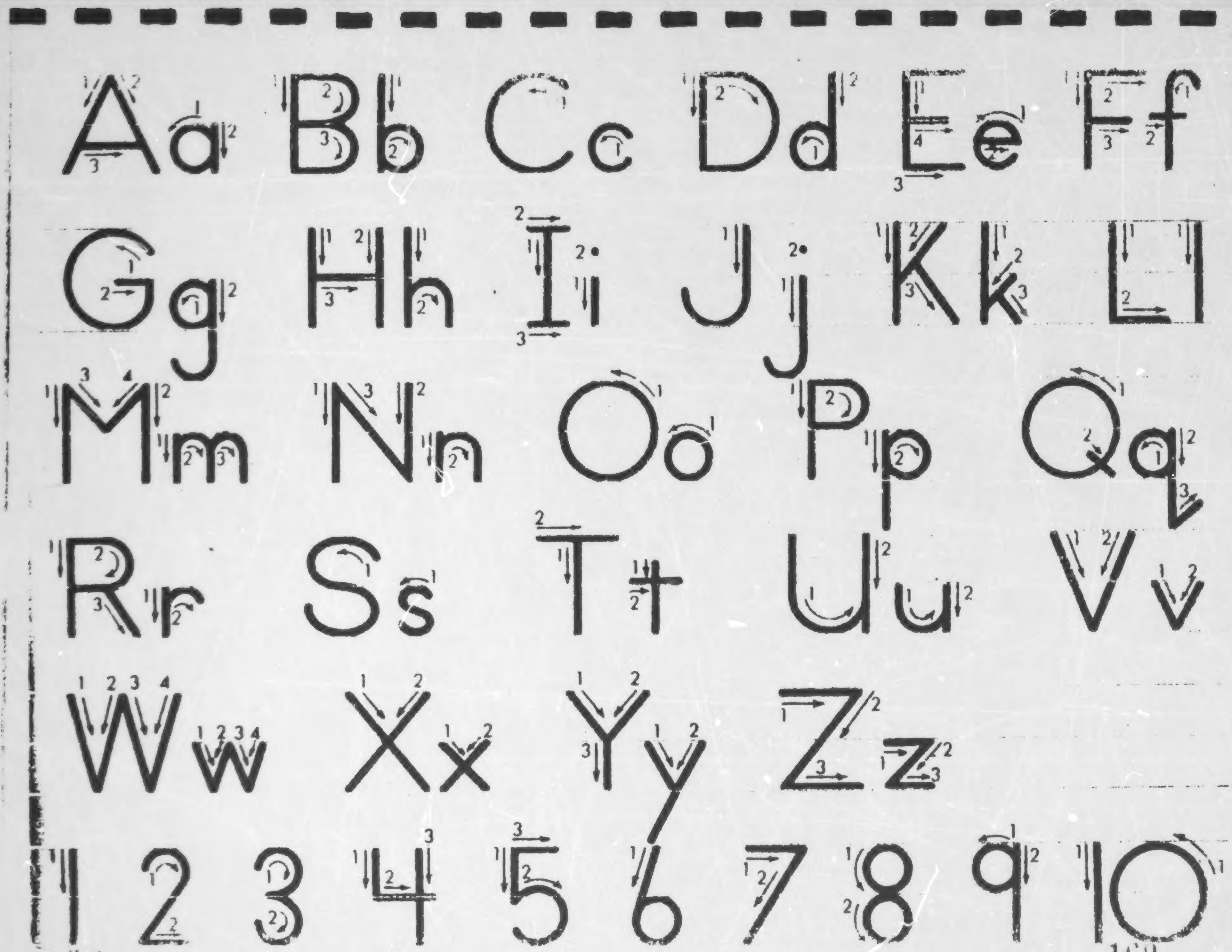
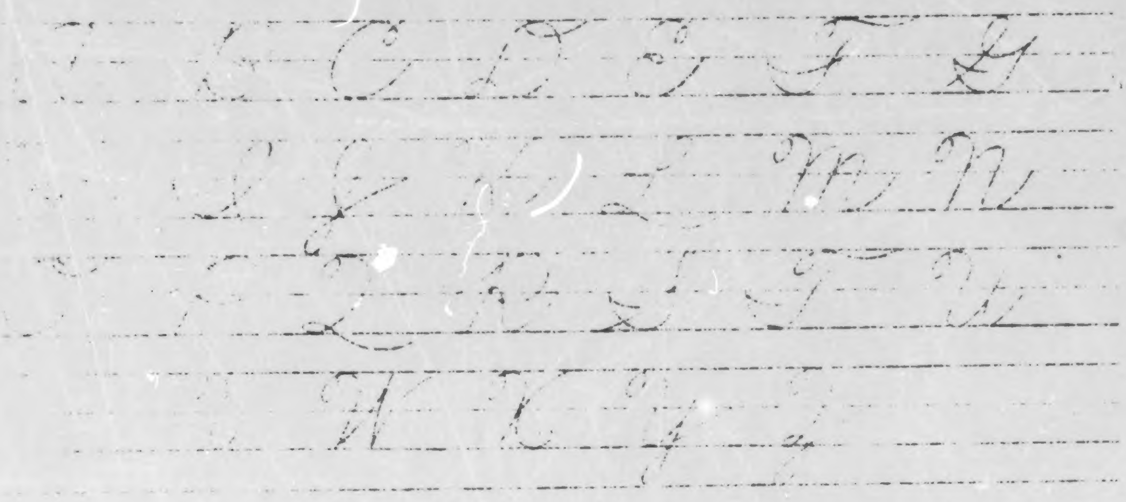
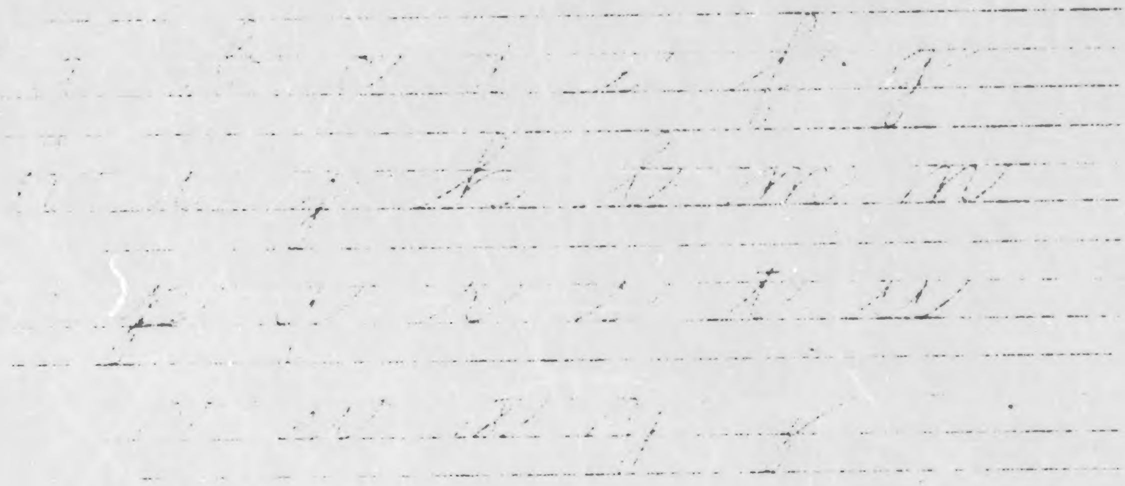

Aa Bb Cc Dd Ee Ff
Gg Hh Ii Jj Kk Ll
Mm Nn Oo Pp Qq
Rr Ss Tt Uu Vv
Ww Xx Yy Zz
1 2 3 4 5 6 7 8 9 10

Handwriting Models





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HEALTH

Use your health display to:

- stress exercise, rest, diet
- explain disease and means to prevent it
- show proper care of teeth, hair and skin
- demonstrate methods of first aid
- methods of building a latrine
- how to purify water
- methods of collecting the rain
- interest children in careers of dresser, nurse, doctor, vitinarian

You can use your health display:

- pictures, slogans, and photo from magazines
- thermometers, bandages, crutches, combs, toothbrushes
- graphs, safety signs, posters, songs and poems
- rubber boots, sandles, raincoats, umbrellas
- soap, sponge, pans
- food packages, CARE food labels, (cereal and milk labels)

SOCIAL STUDIES

Bulletin boards prepared on social studies may feature people, places sorts, products processes, politices, patriots, communication, etc. These displays should have a definite purpose related to the work of the class. Everything should be correctly indentified by labels, captions, illustrations or text.

The following will add interest:

- present facts and unite basic understandings from the many pieces of information
- arouse curiosity and encourage further investigation
- show comparisons between then and now, here and there, time and distance.
- analyze products, inventions, people, forms of government.
- provide opportunities for pupils to creat and plan together.

WRITING AND SPELLING

Your bulletin board can creat a desire to write. It can provide materials that encourage ideas or topics to develop. Please give recognition to children's creative work.

Set up a writer's corner. It will need a collection of imaginative pictures or objects. Place a dictionary, pencil and writing tools in the corner. Permit children to go to this corner when their work is completed so that they can write creatively about the pictures or objects. Set up rules for your writing corner.

- spelling rules
- dictionary skills
- how to study spelling
- work structure and analysis
- meaning of words
- announce team awards
- display word puzzles
- display spelling games ehere children can match words with their meanings.

ARITHMETIC

The arithmetic bulletin board can help children to understand:

- comparisons of size and amount
- parts of things and wholes
- coins and money values
- number families
- methods of measurement
- the vocabulary of arithmetic
- how to read graphs
- the meaning of fractions
- number charts
- number picture cards
- objects for counting
- number games

……

Tone up your bulletin boards with a variety of materials that will add contrast. LOOK ABOUT! The world is full of rough, shiny, soft, spongy, geometric, matted, irregular, dull, irodescent, and colorful materials. Think twice before you pass up or discard unusual substances that have eye appeal.

Be sure you display students work.

SO START GATHERING

Rope - yarn - raffia - split bamboo - reed - seed pods - rice bags - Fanti scraps - egg cartons - wire - screening - nuts - steel wool - boxes - wax paper - sand paper - sand - gravel - moss - pipe cleaner - cellophane - plastic - styrofoam - aluminum foil - leather - unusual wood and bark - sawdust - cardboard - ribbons - buttons - shells - tile - seeds -

LET THE TEXTTURE OF THE ABOVE MATERIALS TICKLE YOUR IMAGINATION AS YOU WORK ON PROJECTS AND PLAN YOUR BULLETIN BOARDS!

ALPHABET TEMPLATES

It is a good idea to have letters cut from cardboard or heavy paper that will be available at any time for tracing or pinning to the bulletin board.

Twisted aluminum foil can be used to form letters. Fasten them to your exhibit with pins, thorns or reed.

Obtain some cotton yarn, string or raffia. Soak it i an extra thick mixture of warm cassava starch. Spread it out on wax paper or a large stone to dry. Try this for letters on the bulletin board, figures and borders.

Cut letters from the mesh (net like texture) from the inside of the bark from the coconut tree. Soak the mesh in a thick mixture of warm cassava starch. Dry before cutting letters and figures.

FLANNEL BOARD

To make a flannel board, secure a piece of board or two sides of a carton or crate. Tack flannel material or a blanket across one side. The other side can be painted as a chalkboard. Lace the two places of carton sides with raffia. In making a flannel board in this manner, it can easily be folded and stored to keep it clean. If flannel or a blanket is not available, cover the surface with thick cassava paste. While it is still wet and sticky pour sand on top. Let the sand and cassava mixture dry in the sun.

Cit pictures from magazines, shapes, numerals, children's sketches, etc. Paste these on cardboard. Cut again. Place a small piece of sandpaper _or cassava and sand) behind each figure. This will make it hold to the flannel board as it is displayed. If the board is made from cassava and sand, use small strips of flannel or blanket on the figures to be displayed.

SCREENS

Screens are also very useful for displaying materials. They add an air of living, a breath of fresh intellectual air to the classroom. Again, local and/or waste materials can be used to advantage at no cost whatever.

1. A strip of matting of the type available anywhere in Liberia will serve.
2. Thin planks to form a border are easily available. Old floor boards will do the job
3. Two sides of a cardboard or wooden carton will serve adequately. If four sides of a carton are used, cut them so as to join them together at the edges with punched holes through which string or raffia can be passed as in stitching. The screen may be painted or left plain.

Stand it upright on the floor or your desk and you are ready to display books, pictures, student work, charts, drawings, etc. A screen serves as an excellent room divider. It will help to cut down the noise in a

See Figure 1 on page 4.

NOTE ABOUT PASTE

Cassava paste to serve as an all purpose paste is quite simple to make. Peel, wash and grate four medium cassavas. Add cold water and strain through a piece of cloth. Pour grated material on a cloth and strain. Using the mixture remaining after straining, wrap in a cloth so as to make a roll that can be squeezed. The idea here is to wash out the starch and save it to use as a paste. The residual cassava chaff should be discarded. Let the starch stand in a container for one hour. Pour off liquid and scrape starch from the bottom of the container and set in the sun to dry. To make paste, place two cups of water into a kettle and boil. A handful of starch mixed with cold water to the consistency of fritter batter should be stirred constantly as boiling water is added. Thick or thin paste can be made depending upon the amount of hot water added. Paste can be stored in covered jars for everyday use in the classroom.

CHART HOLDER

Pieces of wrapping paper or used newspapers make excellent chart holders. Paste together four sheets of regular size newspaper with cassava paste. From the top, measure down three inches and two inches alternately. Draw lines across the paper so that pockets will be of uniform size. Fold up into pockets and fasten edges by pasting strips of paper along the edges, and fold edges on each side to the back. Lay flat to dry. The size of the chart holders will depend upon the size of materials to be inserted. For instance sentence strips will need wider pockets than will value charts, alphabet cards, pictures, spelling words, names for room helpers, etc.

Chapter 5

Using the Taxonomy of Educational Objectives

One of the most helpful guides in identifying and defining instructional objectives is the *Taxonomy of Educational Objectives*, developed by committees under the direction of Bloom (1956) and Krathwohl (1964). The taxonomy provides a classification of educational objectives that is analogous to the classification scheme used for plants and animals. It consists of a set of general and specific categories that encompass all possible learning outcomes that might be expected from instruction. The classification system was developed by psychologists, teachers, and test experts for use in curricculm development, teaching, and testing. Because the system is based on the assumption that learning outcomes can be best described in terms of changes in student behavior, it is especially useful to teachers who are attempting to state their instructional objectives in behavioral terms.

The taxonomy is divided into three parts: (1) the cognitive domain, (2) the affective domain, and (3) the psychomotor domain. The cognitive domain includes those objectives that emphasize intellectual outcomes, such as knowledge, understanding, and thinking skills. The affective domain includes those objectives that emphasize feeling and emotion, such as interests, attitudes, appreciation, and methods of adjustment. The psychomotor domain includes those objectives that emphasize motor skills, such as handwriting, typing, swimming, and operating machinery. A complete classification system was developed for the cognitive and affective domains by the Bloom and Krathwohl committees, but the preparation of the psychomotor domain was never completed. In recent years, however, at least two major classification systems for the psychomotor domain have been prepared, neither one by the original taxonomy developers. We shall present one of these psychomotor systems for illustrative purposes.

The Cognitive and Affective Domains

The cognitive and affective domains have the most highly developed and detailed classification systems. The categories and subcategories in each of these domains are arranged in hierarchical order, from the simplest behavioral outcomes to the most complex. The cognitive domain, for example, starts with simple knowledge outcomes and then proceeds through the increasingly complex levels of comprehension, application, analysis, synthesis, and evaluation. Each category is assumed to include the behavior at the lower levels. Thus comprehension includes the behavior at the knowledge level; application includes that at both the knowledge and comprehension levels, and so on. The affective domain follows a similar hierarchical pattern, ranging from the simple receiving of stimuli to the development of a value system that characterizes an individual's life style.

On the following pages, in Tables II and IV, are brief descriptions of each of the major categories in the cognitive and affective domains. Accompanying Tables (III and V) also present examples of objectives and illustrative behavioral terms (for stating the specific learning outcomes) for each of the categories. These examples should help clarify the meaning of each category and suggest types of learning outcomes to consider when identifying and defining instructional objectives. The illustrative objectives are not exhaustive, of course, but a review of them should stimulate you to think of a broader range of objectives for your particular area of instruction.

The list of behavioral terms for each taxonomy category is only a sample of some of the more relevant action verbs. It must also be kept in mind that frequently the same behavioral term may be appropriately used at several levels. The term *identifies*, for example, is appropriate in each of the following cases:

Knowledge: Identifies the correct definition of the term.
Understanding: Identifies examples of the principle.
Application: Identifies proper grammer usage.
Analysis: Identifies the parts of a sentence.

Despite this considerable overlap in the use of behavioral terms, there are some action verbs that are more directly relevant to one taxonomy category than to another. Those listed in the tables are merely suggestive; but they can assist in selecting the behavioral terms that most clearly convey the instructional intent of a given objective. More comprehensive lists of action verbs for stating specific learning are presented in Appendix B.

If you would like more elaborate and detailed treatments of the cognitive and affective domains, see the handbooks by Bloom (1956) and Krathwohl (1964) in the list of references in Appendix C. Both books provide extensive descriptions of the major and minor categories, with numerous illustrative objectives and test items.

The Psychomotor Domain

The psychomotor domain is concerned with motor skills. Although this domain includes some learning outcomes that are common to most subjects

TABLE II. Major Categories in the Cognitive Domain of the Taxonomy of Educational Objectives (Bloom, 1956)

Descriptions of the Major Categories in the Cognitive Domain
1. **Knowledge.** Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.
2. **Comprehension.** Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.
3. **Application.** Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.
4. **Analysis.** Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.
5. **Synthesis.** Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of *new* patterns or structures.
6. **Evaluation.** Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.

TABLE III. Examples of General Instructional Objectives and Behavioral Terms for the Cognitive Domain of the Taxonomy

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles	Defines, describes, identifies, labels, lists, matches, names, outlines, reproduces, selects, states
Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal material to mathematical formulas Estimates future consequences implied in data Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
Applies concepts and principles to new situations Applies laws and theories to practical situations Solves mathematical problems Constructs charts and graphs Demonstrates correct usage of a method or procedure	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses
Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevancy of data Analyzes the organizational structure of a work (art, music, writing)	Breaks down, diagrams, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, points out, relates, selects, separates, subdivides.
Writes a well organized theme Gives a well organized speech Writes a creative short story (or poem, or music) Proposes a plan for an experiment Integrates learning from different areas into a plan for solving a problem Formulates a new scheme for classifying objects (or events, or ideas)	Categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes
Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work (art, music, writing) by use of internal criteria Judges the value of a work (art, music, writing) by use of external standards of excellence	Appriases, compares, concludes, contrasts, criticizes, describes, discriminates, explains, justifies, interprets, relates, summarizes, supports

TABLE IV. Major Categories in the Affective Domain of the Taxonomy of Educational Objectives (Krathwohl, 1964)

Descriptions of the Major Categories in the Affective Domain
1. **Receiving.** Receiving refers to the student's willingness to attend to particular phenomena or stimuli (classroom activities, textbook, music, etc.). From a teaching standpoint, it is concerned with getting, holding, and directing the student's attention. Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.
2. **Responding.** Responding refers to active participation on the part of the student. At this level he not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under "interests"; that is, those that stress the seeking out and enjoyment of particular activities.
3. **Valuing.** Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon, or behavior. This ranges in degree from the more simple acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in the student's overt behavior. Learning outcomes in this area are concerned with behavior that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under "attitudes" and "appreciation" would fall into this category.
4. **Organization.** Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus the emphasis is on comparing, relating, and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a value system (develops a vocational plan that satisfies his need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category.
5. **Characterization by a Value or Value Complex.** At this level of the affective domain, the individual has a value system that has controlled his behavior for a sufficiently long time for him to have developed a characteristic "life style." Thus the behavior is pervasive, consistent, and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behavior is typical or characteristic of the student. Instructional objectives that are concerned with the student's general patterns of adjustment (personal, social, emotional) would be appropriate here.

TABLE V. Examples of General Instructional Objectives and Behavioral Terms for the Affective Domain of the Taxonomy

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Listens attentively Shows awareness of the importance of learning Shows sensitivity to human needs and social problems Accepts differences of race and culture Attends closely to the classroom activities	Asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, replies, uses
Completes assigned homework Obeys school rules Participates in class discussion Completes laboratory work Volunteers for special tasks Shows interest in subject Enjoys helping others	Answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes
Demonstrates belief in the democratic process Appreciates good literature (art or music) Appreciates the role of science (or other subjects) in everyday life Shows concern for the welfare of others Demonstrates problem-solving attitude Demonstrates commitment to social improvement	Completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works
Recognizes the need for balance between freedom and responsibility in a democracy Recognizes the role of systematic planning in solving problems Accepts responsibility for his own behavior Understands and accepts his own strengths and limitations Formulates a life plan in harmony with his abilities, interests, and beliefs	Adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes
Displays safety consciousness Demonstrates self-reliance in working independently Practices cooperation in group activities Uses objective approach in problem solving Demonstrates industry, punctuality and self-discipline Maintains good health habits	Acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies

TABLE VI. A Classification of Educational Objectives in the
Psychomotor Domain (Simpson, 1972)

Description of the Major Categories in the Psychomotor Domain
1. **Perception.** The first level is concerned with the use of the sense organs to obtain cues that guide motor activity. This category ranges from sensory stimulation (awareness of a stimulus), through cue selection (selecting task-relevant cues), to translation (relating cue perception to action in a performance).
2. **Set.** Set refers to readiness to take a particular type of action. This category includes mental set (mental readiness to act), physical set (physical readiness to act), and emotional set (williness to act). Perception of cues serves as an important prerequisite for this level.
3. **Guided Response.** Guided response is concerned with the early stages in learning a complex skill. It includes imitation (repeating an act demonstrated by the instructor) and trial and error (using a multiple-response approach to identify an appropriate response). Adequacy of performance is judged by an instructor or by a suitable set of criteria.
4. **Mechanism.** Mechanism is concerned with performance acts where the learned responses have become habitual and the movements can be performed with some confidence and proficiency. Learning outcomes at this level are concerned with performance skills of various types, but the movement patterns are less complex than at the next higher level.
5. **Complex Overt Response.** Complex Overt Response is concerned with the skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, smooth, accurate performance, requiring a minimum of energy. This catergory includes resolution of uncertainty (performs without hesitation) and automatic performance (movements are made with ease and good muscle control). Learning outcomes at this level include highly coordinated motor activities.
6. **Adaptation.** Adaptation is concerned with skills that are so well developed that the individual can modify movement patterns to fit special requirements or to meet a problem situation.
7. **Origination.** Origination refers to the creating of new movement patterns to fit a particular situation or specific problem. Learning outcomes at this level emphasize creativity based upon highly developed skills.

TABLE VII. Examples of General Instructional Objectives and Behavioral Terms for the Psychomotor Domain

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Recognizes malfunction by sound of machine Relates taste of food to need for seasoning Relates music to a particular dance step	Chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects, separates
Knows sequence of steps in vanishing wood Demonstrates proper bodily stance for batting a ball Shows desire to type efficiently	Begins, displays, explains, moves, proceeds, reacts, responds, shows, starts, volunteers
Performs a golf swing as demonstrated Applies first aid bandage as demonstrated Determines best sequence for preparing a meal	Assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends mixes, organizes, sketches, works
Writes smoothly and legibly Sets up laboratory equipment Operates a slide projector Demonstrates a simple dance step	(Same list as for Guided Response)
Operates a power saw skillfully Demonstrates correct form in swimming Demonstrates skill in driving an automobile Performs skillfully on the violin Repairs electronic equipment quickly and accurately	(Same list as for Guided Response)
Adjusts tennis play to counteract opponent's style Modifies swimming strokes to fit the roughness of the water	Adapts, alters, changes, rearranges, reorganizes, revises, varies
Creates a dance step Creates a musical composition Designs a new dress style	Arranges, combines, composes, constructs, creates, designs, originates

(writing, speaking, laboratory skills), it receives major emphasis in commercial subjects, health sciences, home economics, industrial education, physical education, art, and music. Performance skills play a prominent role in the instructional objectives in these areas.

The classification system for the psychomotor domain that is shown in Table VI is one developed by Simpson (1972). It was selected for use because the categories seem appropriate for classifying a wide variety of different type motor skills. The major caterories, ranging from perception (the lowest level) to origination (the highest level), have a hierarchical arrangement similar to that in the cognitive and affective domains. As with the other two domains, illustrative objectives and relevant behavioral terms are presented for each category (see Table VII), to further clarify the various behavioral levels and to suggest types of learning outcomes to consider.

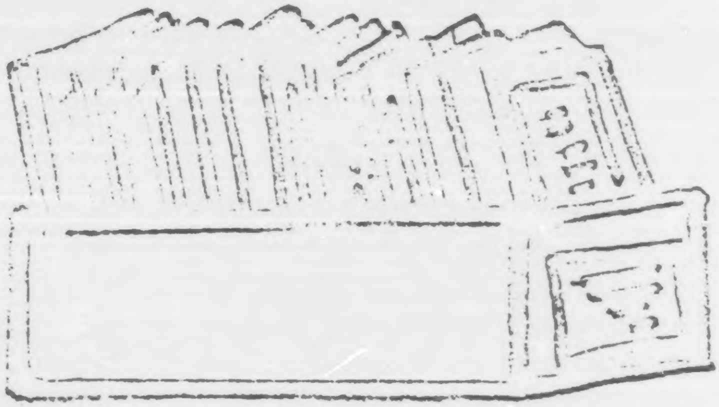
A taxonomy in the psychomotor domain has also been developed by Harrow (1972). Her taxonomy seems to be especially well adapted to the area of physical education, but may prove useful in other areas as well.

Instructional objectives in the psychomotor domain typically include concomitant cognitive and affective elements, but the demonstration of a motor skill is the dominant characteristic of the student's response. This overlapping of behavior from the different domains is, of course, not limited to performance skills. Learning outcomes in the cognitive area have some affective elements, and outcomes in the affective area have some coginative components. The three domains of the taxonomy provide a useful classification system, but they simply respresent particular emphases in stating objectives and not mutually exclusive divisions.

In summary, the *Taxonomy of Educational Objectives* provides a three-domain scheme (cognitive, affective, and psychomotor) for classifying all possible instructional objectives. Each domain is subdivided into a series of categories that are arranged in hierarchical order—from simple to complex. A review of these categories and the illustrative objectives and behavioral terms accompanying them (Tables II to VII) should aid in (1) identifying objectives for a particular instructional unit, (2) stating objectives at the proper level of generality, (3) defining objectives in the most relevant behavioral terms, (4) checking on the comprehensiveness of a list of objectives, and (5) communicating with others concerning the nature and level of learning outcomes included in a list of objectives.

As useful as the taxonomy may be, don't become a slave to the system of classification. Some objectives will include elements of all three taxonomy domains. Such objectives should not be discarded simply because they are difficult to classify. If revision will increase their usefulness, as well as their identification with one of the domains, then revision may be the answer. But if revision of the objectives distorts rather than clarifies their instructional intent, the original statements should be retained. In short, the taxonomy should serve as a guide—not as a master.

Learning Packages



INDIVIDUALIZING INSTRUCTION

A. Some techniques for Individualizing Instruction

1. TEAM TEACHING: Two or more teachers plan together ways and means to help a group of pupils.

2. INDIVIDUALIZED HELP: Pupils work problems that are included in a particular topic, then check them against answers provided by the teacher. The problems that are not worked correctly are tried again and if they are still lacking, the teacher takes immediate steps to determine and correct the pupils' needs. To be effective, the classroom must be used by and with individuals, pairs, or small groups of pupils.

3. INDIVIDUALIZED ASSIGNMENTS: After a lesson presentation or development for a large group, the teacher, already knowing his pupils' capabilities and interests, places the pupils in activities aimed at helping them to succeed in these assignments at their individual rates.

4. PROGRAMMED LESSONS: Carefully written lessons, in which each small step is developed and illustrated, if geared to a child's reading or math level, can help him to catch up when he has missed a small portion of his work.

5. PUPIL CONTRACTS: For practice of a designated skill, the pupil follows a pre-arranged sequence of steps. This can be a set of instructions about which assignments to do, or it can be a check sheet where he indicated what he agrees to do.

   (Note Pupil Contracts and/or Programmed Lessons must be matched to pupils' needs, so that they will not degenerate into "busy work". They can be extremely helpful when they are well-planned.)

6. SPECIAL TUTORING: Done as pupil-by-pupil or pupil-by-adult, this technique is highly individualized. Sometimes progress is slow and barely noticeable, but the personal touch can help a child who has an emotional problem or some other hindrance for working with other children.

7. LEARNING STATIONS: Some laboratory classrooms are set up with special "Centers" or "Stations" for specific mathematical experiences. These places for Basic Facts, or Problems to Try, or Strengthening Computational Skills, or Games to Test skill, or many other mathematical experiences can go a long way in motivation, stabilizing, even evaluating pupil progress. Such a classroom as this must be well-stocked and well-planned for contunuous experiences at many levels.

INDIVIDUALIZED INSTRUCTION

DEFINITION

Individualized instuction is a process of gearing the instructional program to meet the needs, interest, and abilities of individual pupils. This instruction may be accomplished on a one-to-one relationship, in non permanent groups in varying sizes or through the involvement of pupils in independent study.

Individualized instruction is a broad approach in helping children to learn. It sets up flexible class environment, a creative learning climate, and provides opportunities for self selection, self direction, self pacing, and self evaluation on the part of the learner.

APPROACHES TO INDIVIDUALIZED INSTRUCTION

Identification of the needs, interests, and potential of pupils to be involved in the program through observations, formal and informal tests, checklists, interest finders, sociograms, etc.

A broad knowledge of concepts, understandings, and skills to be developed, reinforced, and enriched.

Involvement of resource teachers, specialists, consultants, mobilization team member, librarians, and counselors in planning the individualized instructional program.

Use a wide variety of materials and equipment:

Books
Workbooks
Magazines
Newspapers
Pictures
Illustrations
Cartoons
Photos
Encyclopedia
Almanacs
Yearbooks
Charts
Graphs
Globes
Maps
Slides
Projectors
Viewflex
Listening centers
Tapes
Records
Radio
Television
Games
Pocket charts
Transparencies
Sara wrap
Portable chalk board

Setting up a procedure for operating and evaluating the individualized instructional program.

Establishing techniques and instruments for keeping records and measuring pupils' progress:

Checklists
Contracts
Conferences
Sign up sheets
Programmed materials
Teacher-kept records
Child-kept records

8. LEARNING PACKAGES: This technique is complete within itself for diagnostic, prescriptive, and evaluative assistance.

B. Common elements in all of these Techniques

1. The learner is freed from group pacing at some point to move at his own rate and/or interest.
2. The learner may use a diversity of learning media.
3. The learner will have one-to-one instructional interaction of varying periods of time with his teacher, a peer-tutor, or some other educational aide.

SUMMARY STATEMENT

All of us have used some form of individualizing instruction during our teaching career. For an instructional program to be effective, a combination of these techniques must be used.

LEARNING PACKAGES

I. An Overview

A. A learning package is a complete, organized, self-instructional unit of resources for one specific concept or skill (or a related group of skills)

B. A complete learning package consists of:
1. Clear indication of its subject
2. A statement of its purpose
3. A pre-test using criterion measures
4. Instructions and materials for small steps or progress
5. A post-test using criterion measures

(Note: Any package which contains only items 1 & 4 of the above can be an instructional packet)

C. A learning package should accomplish the following:
1. Tell the learner what he is to do and why
2. Let him do it with reasonable freedom of time and method
3. Tell him if he did it successfully

D. Who benefits from the learning packages?

1. Learning packages are for the learners who are at a stage of development in which they can help themselves. Every learner needs and benefits from this kind of independence if it is given to him wisely. It helps him to know himself as well as to help himself.

2. Learning packages also benefit the teacher by allowing him time to design each experience to fit the individual (or small groups of) learners. Also, the teacher can thus apportion his time and attention to the learners who need him most.

II. Procedures for Producing and Using A Learning Package

A. Select an objective from the Minimum Achievement Skills.

B. Write a post-test, which may serve as the pre-test, for diagnosis.

C. Write an outline of a sequence of instructions which provides for:
   1. Small steps of learning
   2. Motivating prompts or cues
   3. Practice and knowledge of results

D. Prepare materials with sufficient directions so that the learner can work through the package without additional help from you.

E. Administer the package to a few learners. If the objectives are not achieved, revise the package.

F. Talking with learners will help locate inadequacies in the package. Notes should be kept regarding development of the package and the history of the tryout, including student comments or other reasons for revision.

III. Keeping Records

A. Individual student folder
   1. Guide sheets or contract
   2. Remedial or drill work completed
   3. Chapters in textbook, if used, completed
   4. Related outside work

B. Teacher kept folder for each student
   1. Teacher-constructed tests completed by the student that show his weak or strong points.
   2. Samples of the student's work
   3. Notes taken during conferences with student
   4. Notes taken while observing student
   5. Reports of conferences with parents.
   6. Copies of reports issued to the parents
   7. Notes describing any special talents or p hysical disabilities (emotional or mental)

(Note: Each student should know what information is kept about him.)

IV. Summary Statement

A. On learning packages
   1. They are not the "answer" alone or within themselves as a technique in individualizing instruction.
   2. They do not take the place of developmental teaching by the teacher.
   3. All children are not at the level of independent, self-controlled work to benefit from this technique.
   4. Learning packages can be used for enrichment, as well as remedial purposes.

B. On individualizing instruction

1. The best and most effective instructional program may use a combination of techniques for individualizing instruction.
2. Since "variety is the spice of life", an effective program can be devised which will be both constructive and stimulating for both teacher and learner.

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Guidelines for Constructing and Using Learning Packages

1. Assess the pupil's home background and interests.
2. Administer standardized and informal diagnostic tests.
3. Analyze the test results and record the data.
4. Select on the basis of the diagnoistic test information, those skill areas which need to be developed.
5. Write the learning objective, stating the desired measure of accuracy.
6. Construct the pre-test, and post-test.
7. Administer the pre-test and analyze the results.
8. Construct alternate learning paths or strategies to accomplish the learning objectives.
9. Determine the media for presentation.
10. Write the prescription.
11. Prepare two folders, one for the teacher andone for the child.
12. Have the child work through the sequence.
13. Administer the post-test to determine mastery of the objective.
14. Analyze post-test results.
15. Revise the learning system to either re-test or move on to the next skill level.

PREPARING BEHAVIROAL OBJECTIVES

When writing a behaviroal objective the object is to write objectives that communicate; therefore the following steps should be kept in mind:

First, indentify the terminal behavior by name; you can specify the kind of behavior that will be accepted as evidence that the learner has achieved the objectives.

Second, try to define the desired behavior further by describing the important conditions under which the behavior will be expected to occur.

Third, specify the criteria of aceptable performance by describing how well the learner must perform to be considered acceptable.

Three of the terms that will be used bear defining: Behavior........ refers to any visible activity displayed by a learner (student). Terminal behavior..............refers to the behavior you would like your learner to be able to demonstrate at the time your influence over him ends. Criterion................is a standard or test by which terminal behavior is evaluated.

An objective is an intent communicated by a statement describing a proposed change in a learner-a statement of what the learner is to be like when he has successfully completed a learning experience. It is a description of a pattern of behavior (performance) we want the learner to be able to demonstrate.

A course description tells you something about the content and procedures of a course; a course objective describes a desired outcome of a course. Whereas an objective tells what the learner is to be like as a result of some learning experiences, the courses description tells only what the course is about.

A meaningfully stated objective, then, is one that succeeds in communicating your intent; the best statement is the one that excludes the greatest number of possible alternatives to your goal. Unfortunately, there are many "loaded" words, words open to a wide range of interpretation. To the extent that you use ONLY such words, you leave yourself open to disinterpretation.

Consider the following examples of words in this light:

Words open to many	Words open to fewer interpretation
to know	to write
to understand	to recite
to really understand	to identify
to appreciate	to differentite
to fully appreciate	to solve
to grasp the significance of	to construct
to enjoy	to list
to believe	to compare
to have faith in	to contrast

How can you write objectives that will describe the desired behavior of the learner:

First: identify the terminal behavior by name; you can specify the kind of behavior that will be accepted as evidence that the learner has achieved the objective.

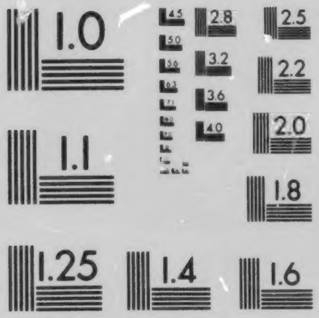
Second: try to define the desired behavior further by describing the important conditions under which the behavior will be expected to occur.

Third: specify the criteria of acceptable performance by describing how well the learner must perform to be considered acceptable.

Use the following statements to test the clarity and completeness of your objectives:

1. Does the statement describe what the learner will be doing when he is demonstrating that he has reached the objective?
2. Does the statement describe the important conditions (given or restrictions, or both) under which the learner will be expected to demonstrate his competence?
3. Does the statement indicate how the learner will be evaluated? Does it describe at least the lower limit of acceptable performance?

A5


1.0
4.5
2.8
2.5
5.0
3.2
2.2
5.6
6.3
3.6
7.1
8.0
4.0
2.0
1.1
1.8
1.25
1.4
1.6

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

INSTRUCTIONAL OBJECTIVES

Place an X before each objective which is properly stated.

___ The student will grasp the significance of the Treaty of Versailles.

___ The student has an attitude favorable to English grammar indicated by his response to a questionnaire.

___ The student will know 6 verbs.

___ The student will learn the names of the common tools in woodshop.

___ The teacher will list 3 major causes of the Civil War.

___ The student will know the important battles of World War 1.

___ The student will prefer cooking to sewing.

___ The student will correctly thread a sewing machine.

___ The student will pay attention as the teacher demonstrates the use of a drill.

___ The student will develop a sense of the cultural unity of man.

___ The student will list and describe the themes of 4 of Shelley's poems.

___ The child will develop an interest in leisure sports.

___ The student will give indications of a desire to learn more history.by volunteering to present an extra oral report.

___ The teacher will describe with understanding five concepts treated in the text.

___ The student will correctly solve 10 story problems.

___ The student will enjoy a record, "The Three Pigs".

___ The student will become familiar with the 4 kinds of sentences.

___ The student will construct a model of the earth.

___ The student will know the letters of the alphabet.

___ The student will contrast 2 objects.

___ The student will learn the rules of good safety.

___ The student will list 10 rules of good conduct.

CLASSROOM MANAGEMENT

WHAT IS IT?

1. Systematic organization of the classroom
2. Specified outcomes, procedures, and evaluation

HOW DOES IT WORK?

1. Specification of outcomes
2. Specification of procedures to achieve outcomes
3. Specification of evaluation techniques to measure success and failure

HOW DO I KEEP THE SYSTEM GOING?

1. Record goals on some regular basis
2. Revise individual and group goals
3. Institute a graph or progress chart for teacher and student

HOW DO I EVALUATE?

Measure real outcomes by expected outcomes

WHAT IS THE TEACHER'S ROLE?

1. Attend to individual and group progress records
2. Supply necessary feedback and instruction
3. Establish new "for fun" or enrichment group activities

WHEN WILL A CLASSROOM MANAGEMENT SYSTEM NOT WORK?

1. If there are no specified goals
2. If there is no record keeping system
3. If there is no evaluation procedures
4. If there is no teacher-to-student feedback

LEVEL 4 Sample Learning Package

I. *A. A. P. Objective: He can alphabetize words of newly acquired vocabulary by first, second, and third letters.

II. Behavioral Objectives:

A. Prime Behavioral Objective - Given a list of 10 newly acquired vocabulary words, students will alphabetize them by the first, second, and third letters with 100% accuracy.

B. Building-Block Behavioral Objectives

1. Given a list of 10 new vocabulary words, students will alphabetize them by the first letter with 100% accuracy.
2. Given a list of 10 new vocabulary words, students will alphabetize them by the first, and second letters with 100% accuracy.

III. Sample Pre-Test

A. Below are 20 words from our new unit in Geography. Look at them carefully, then put them in alphabetical order. Use the numerals 1-20 in the blocks.

________ cotton

________ Mississippi

________ plantation

________ gulf

________ floods

________ Jacksonville

________ rice

________everglades

________basin

________Flordia

________tobacco

________Montgomery

________delta

________Alabama

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* "Sequential Inventory of Reading Skills" K-6 70-71 Gr. - Study-Reading p. 14 #1

Sample Pre-Test continued.

________ Charlotte ________ peanuts

________ Reconstruction ________ Mobile

________ Georgia ________ Atlanta

On this test there is an opportunity to demonstrate skill in alphabetizing using the first, second, and third letters.

B. Below are 5 rows across of three words. Use the numerals 1, 2, and 3 to put each row in alphabetical order.

________ basin ________ rice ________ cotton

________ floods ________ gulf ________ peanuts

________ sugar ________ South Carolina ________ citrus

________ plantation ________ plains ________ peninsula

________ Montgomery ________ Mississippi ________ Mobile

The results of the pre-test should help the teacher determine which children need work mastering the Building-Block Objectives and/or the Prime Behavioral Objectives.

IV. Learning Paths:

1. Teacher led presentations using pictures, picture-word cards, word cards, etc.
2. Picture dictionary for levels indicated.
3. Practice Sheets for levels indicated.
4. Practice exercises for levels indicated, in Phonics We Use books D, C, E.
5. Match - O game and other games available.

V. Post - Test for Objectives and Directions

A. Building-Block Objective (A)
Put these words in alphabetical order by putting the numerals 1-5 in the correct blanks.

_______ floods

_______ Atlanta

_______ delta

_______ cotton

_______ basin

B. Building-Block Objective (B)
Put these words in alphabetical order using the first two letters. The words are in pairs. Use the numerals 1 and 2 to show order.

a.________ cotton ________ citrus

b.________ sugar ________ South.Carolina

c.________ Reconstruction ________ rice

d.________ peanuts ________ Planation

When 100% accuracy is attained, move to Prime Objective

C. Prime Objective
Below are 10 new geography words. Put them in alphabetical order. Use the blanks given:

Word List: plains, Mobile, Alabama, plantation, Albany, Montgomery, Flordia, Baton Rouge, basin, flood

1.________ 2.________ 3.________

4.________ 5.________ 6.________

7.________ 8.________ 9.________

10.________

INSTRUCTIONAL SEQUENCE

"A Guide for teachers to develop a sequence for learning"

I. Developing Readiness

- determining experiential background
  - give students a chance to discuss and relate their personal knowledge
  - teacher adds her experience
  - use visual aides: maps, films, charts, pictures, etc.
- teaching technical vocabulary and vocabulary unique to the subject matter
  - introduce vocabulary orally and in context
  - use overlays, chalkboard, transparencies, etc.
  - emphasize correct pronounciation of these words by calling attention to prefixes, suffixes, root words, syllabication, vowel sounds and their relationship to spelling
  - point out that a previously accepted definition of a word may not apply in a different setting and that the words may shift meaning according to context.
- clarifying of concepts
  - stress transfer of varied background experiences into subject matter context
  - discussion of the precise use of words to enhance understandings and to increase one's ability to think
- setting purpose
  - ask leading questions to guide pupils thinking in terms of general and specific purposes for reading
  - achievement of goals successfully in a sequential pattern tends to motivate thinking and promote further study

II. Silent Reading

- use the table of contents, index
- read title, chapter and boldface headings
- observe pictures, maps, graphs, etc. and read captions
- note the technical study skills necessary for effective and efficient reading:
  - main idea
  - skimming and scanning
  - sequence and organization
  - inference
  - specific facts
  - classify, compare, contrast
- teacher confers with individual pupils needing assistance with vocabulary and concepts
- silent reading assignments should not be lengthy
  - This activity should be used to strengthen and reinforce vocabulary and concepts and to encourage students to read critically rather than to just gather facts.

III. Discussing Material (according to purposes)

- teacher investigates to find whether or not pupils have grasped the concepts and ideas underlying the facts by asking the following questions:
  - factual or literal

(continued)

III. Discussing Material (continued)

- critical
  - Semantic variation of vocabulary
  - Central theme
  - Key idea
  - Inference
  - Generalization
  - Problem Solving
  - Association of Ideas
  - Analogy
  - Sequence
  - Extraneous Idea
  - Author's purpose
- based on these findings the teacher provides further guidance.

IV. Rereading

- Rereading can be either silent or oral and should always be done for a specific purpose:
  - to correct misunderstandings and misinterpretations
  - for clarification of concepts and ideas
  - for confirmation of judgments
  - for clarification of vocabulary
  - to locate specific information

V. Summarizing and Providing Follow-up

- applying to new media--charts, maps, models, play acting
- transferring to new situations
- comparing to different situations
- relating to the situation--be able to speak intelligently about the subject.

SKILL	WAYS OF ASKING QUESTIONS
1. fact	Did you find out? (who, what, when, where)
2. inference	How can you tell that __________________?
3. inference	What makes you think that ________________?
4. inference	What evidence can you find for __________?
5. vocabulary (new word)	How is ___________ like _________________?
6. vocabulary (new word)	How is _______________different _________?
7. main idea	What is the main idea in the second paragraph?
8. key word	What is the key word in the topic sentence in the first paragraph?
9. subordinate ideas	What are the details in paragraph three?
10. sequence	Tell the events in the order in which they happen.
11. predict outcome	What do you think will happen next?
12. sequence	What happened before _________________?
13. sequence	What happened after __________________?
14. creative	What would happen if__________________?
15. creative/critical	Who would you (not) like to be in this story? Why?
16. critical/creative	How would you have written (ended) this story if you were the author?
17. vocabulary/multiple meaning	What meaning does _________ have in this sentence?
18. vocabulary (synonym)	What is another word for ________________?
19. main idea	Can you write another title for this story?
20. interpretation	How did this story make you feel?
21. interpretation	In your own words, tell what is meant when the author says _________________________________?
22. fact	What did ________ do after _________ happened?
23. inference	What information in the story would justify you thinking that __________________________?
24. creative	If you had been in this situation, what would you have done?
25. critical	How could what you have just read be applied to our problem of __________________________?
26. critical	Can you find or do you know of a source that disagrees with the article (story) you just read?
27. key words	What are the key words for paragraph _______? (What words do you need to understand the paragraph?)

LANGUAGE GUIDE FOR PARENTS

1. ENCOURAGE YOUR CHILD TO TALK TO YOU AND TAKE TIME TO TALK TO YOUR CHILD.
2. TRY TO GIVE HIM YOUR UNDIVIDED ATTENTION FOR AT LEAST A SHORT PERIOD OF TIME EVERY DAY.
3. LET HIM TELL YOU WHAT HE DID, WHAT HE SAID, AND HOW HE DID IT.
4. ASK HIM QUESTIONS AND ENCOURAGE HIM TO SPEAK.
5. LISTEN TO HIS IDEAS.
6. ANSWER HIS QUESTIONS.
7. REWARD HIM WITH VERBAL PRAISE (THAT'S GOOD - YOU DID WELL).
8. MAKE YOUR CHILD ALERT TO SOUNDS AROUND HIM.
9. IDENTIFY SOUNDS FOR YOUR CHILD.
10. ASK HIM WHAT HE THINKS ABOUT MATTERS WHICH HE CAN UNDERSTAND.
11. NAME THINGS FOR YOUR CHILD - HELP HIM TO CALL THINGS BY THEIR RIGHT NAME.
12. HELP HIM TO LOOK AT PICTURES AND DESCRIBE WHAT HE SEES.
13. HELP HIM TO MAKE UP STORIES ABOUT PICTURES.
14. TELL HIM STORIES, FAIRY TALES, AND NURSERY RHYMES.
15. STIMULATE YOUR CHILD TO SPEAK. YOU MAY WANT TO PUT MAGAZINE PICTURES ON THE WALL OR GIVE HIM OBJECTS TO TALK ABOUT.
16. HELP YOUR CHILD TO LISTEN TO THE SOUNDS AROUND HIM AND IDENTIFY THEM. (THE RING OF THE PHONE, THE TELEVISION, THE POTS AND PANS, THE WATER, THE DOOR SLAMMING, THE WINDOW CLOSING, THE CLAPPING OF HANDS).
17. YOU CAN PLAY A GAME WITH YOUR CHILD - YOU MAKE SOUNDS AND HAVE HIM TELL YOU WHAT HE HAS HEARD.
18. TAKE YOUR CHILD FOR A WALK AND TALK ABOUT THE THINGS YOU SEE AND HEAR.
19. WHILE YOU'RE COOKING, TALK TO YOUR CHILD ABOUT THE FOODS YOU ARE MAKING AND THE THINGS YOU ARE DOING.
20. ON A TRIP TO THE GROCERY STORE, TELL YOUR CHILD WHAT YOU'RE BUYING - NAME THE FOODS FOR YOUR CHILD. DO THE SAME THING IN ANY OTHER STORE.
21. WHENEVER YOU GO ANY PLACE WITH YOUR CHILD, TRY TO TALK TO HIM ABOUT WHERE YOU ARE AND WHAT YOU SEE, HEAR AND DO.
22. HELP YOUR CHILD TO NOTICE THE THINGS IN HIS ENVIRONMENT. POINT OUT THINGS TO HIM AND PERHAPS, EVEN PLAY A GAME OF COUNTING HOW MANY DIFFERENT THINGS HE SEES OR HOW MANY OF ONE THING HE SEES."
23. TAKE EVERY OPPORTUNITY TO TALK TO YOUR CHILD!

GROUPING STRATEGIES

The purpose of grouping for instruction is to meet students' needs. Use can be made of students' achievement levels and skills needs as a major consideration for grouping.

Reasons for grouping for instruction

1. management of a wide variety of ability and skill levels
2. students respond more readily in small groups
3. gives more students an opportunity to participate in discussion
4. allows teacher to get to know and hear from every student in the class
5. can be a diagnostic tool to assess knowledge of students
6. offers assistance or extra challenge to students
7. gives students a chance to practice skills covered in teacher directed activities
8. improves discipline (change of pace)

Ways of Grouping for Instruction

1. skills needs
   -comprehension
   -research and reference
   -basic reading skills
   -language skills
2. reading levels
3. ability levels
4. interests

Other considerations that affect grouping for instruction

1. pace of learning
2. work habits (degree of independence)
3. motivation
4. social interaction
5. learning styles
6. type of homework needed

SKILL	WAYS OF ASKING QUESTIONS
1. fact	Did you find out? (who, what, when, where)
2. inference	How can you tell that __________?
3. inference	What makes you think that __________?
4. inference	What evidence can you find for __________?
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27. key words	What are the key words for paragraph __________? (What words do you need to understand the paragraph?)

CREATING A POSITIVE CLASSROOM CLIMATE

Teachers make a difference when they:

- believe students are able and communicate that belief to them
- create a warm climate by monitoring their own body language and non-verbal communications
- remember and use each student's name
- effectively use open-ended questions
- increase the "wait-time" (silence) given students to respond to questions and the "wait-time" after a response is given before teacher closure
- call on kids in a systematic rather than random way so every child has a reasonable chance of being called on
- arrange a physically attractive atmosphere (hanging plants, expandable library, special work areas)
- find the person in the student by remembering birthdays, improvement, unique interests or abilities
- use student "experts" for teaching and/or demonstration
- teach something tough (to enhance the success experience) and expect a reasonable amount of work
- praise honest success no matter how small, but limit praise to things a student actually did—don't patronize
- have students acknowledge the messages they (teachers) send
- send double-strength invitations—through another teacher to the student
- develop class spirit and be a booster at school activities
- communicate to students that mistatkes are understandable and forgiveable but are also correctable

Compiled from Inviting School Success: A Self-Concept Approach to Teaching and Learning by William Watson Purkey

Follow-up Activities

VOCABULARY

Directions: Rewrite the following sentences. As you do, replace each underlined word with a synonym.

1. Screaming fire in a crowded theater is prohibited by law.

____

2. Each new group of immigrants experienced special problems.

____

3. Farmers moved to urban areas.

____

4. It was hard for migrant farmers to cope with city life.

____

5. The 19th century saw a rapid expansion of industries and cities.

____

COMPREHENSION

Directions: Write the answers to the following questions in complete sentences.

1. What factors led many migrant farmers and immigrants to crime?
2. Do you think moving from farms to cities affected family life? How?

WORD STUDY

Directions: Re-write the following words and divide them into syllables.

1. migrant ______________
2. immigrants ______________
3. discrimination ______________
4. American ______________
5. families ______________
6. slavery ______________
7. urban ______________
8. disorders ______________

Follow-up Activities

ORGANIZATION

Directions: Read the following words. List the words that go under each main topic.

defeatism
respect
self-confidence
mistrust
love
hate
harmonious
fear
greed
shame

POSITIVE FEELINGS

NEGATIVE FEELINGS

VOCABULARY

Directions: Locate each word in the dictionary. Write the two guide words from the dictionary page.

1. harmony ________________________________
2. immediate ________________________________
3. respect ________________________________
4. trust ________________________________
5. shame ________________________________
6. freedom ________________________________
7. influence ________________________________
8. fear ________________________________

COMPREHENSION

Directions: Write a short paragraph describing Dick Gregory's teacher.

Follow-up Activities

VOCABULARY

Directions: Define the following words, without using the dictionary.

1. custody
2. conduct
3. emancipated
4. wards (of the state)
5. consent
6. earnings

COMPREHENSION

Directions: In your own words, write a sentence or two describing each of the particular rights and duties described on pages 38 and 39.

WORD STUDY

Directions: Write 15 three syllable words from pages 38 and 39.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.

UNIT V: What Should Be Considered In Making Decisions As Consumers?

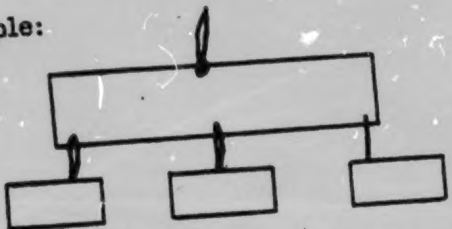
Vocabulary follow-up activities, using vocabulary list in Appendix V-25/26.

Activity 1: Synonym mobiles.

Materials: Thesaurus, construction paper, scissors, string, magic markers.

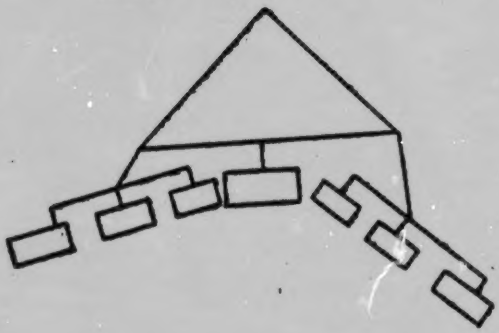
Procedure: Students take _____ number of words from list.
Students find three synonyms for each word in Thesaurus.
Students write vocabulary word on folded construction paper (lengthwise).
Students hang synonyms from main word to form mobile.

Example:



Variations: Students make mobiles using root word as main word and hang other words using same root.

Students make mobiles using root from vocabulary word and form mobile by hanging different prefixes and suffixes to root word.



Students construct mobiles by writing vocabulary word on main mobile and finding illustrations describing that word. Hang illustrations from main word.

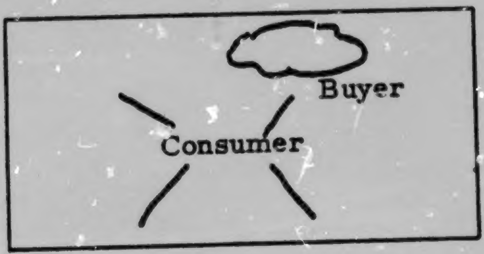
Activity 2: Making illustrative charts using vocabulary words

Materials: Tagboard, construction paper, magic markers media examples (newspaper, magazines)

Procedure: Student writes word in center of tagboard/construction paper. Around the word, students write synonyms and illustrate them by hand or cut out examples from media and paste them on.

Variation: Instead of synonyms, students use examples of word as explanation or definition.

Students use a specific term and find examples of that term from media.



Activity 3: Tic Tac Dough (Play like television show.)

Materials: Tagboard or cardboard tic tac toe boards

Procedure: Could be played as class activity, class separated into two teams, or two students could play it in an independent activity.

Place nine different vocabulary words at a time on board. In order to place an X or O, student must define consumer term and use it correctly in a sentence.

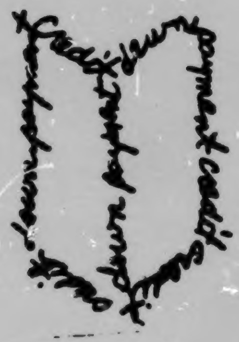
For added interest, students submit words, definition and sentences to be used; one team could submit words for the other.

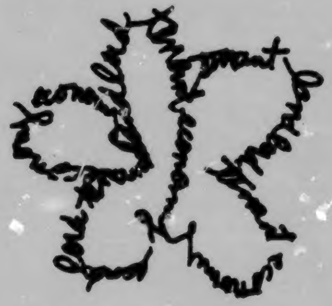
brand name	supply	credit
demand	down payment	interest
grading	expenses	plain folk

Activity 4: Vocabulary designs*

Materials: Unlined paper, different colored pencils, pens.

Procedure: Students use vocabulary words to make designs. Use each word at least three times; may use 3-4 words in each design.





Activity 5: Definition Bingo Consumer Bingo

Materials: Bingo boards with different vocabulary words in different boxes on different boards, markers.

Procedure: Could be played as class activity or small group.

Teacher calls out definition; if student can fit definition to word, he/she places marker over it.

*Vocabulary designs are not recommended for use with students who may have directionality, sequence, and/or letter formation problems.

FOLLOWING DIRECTIONS

1. Write your name in the upper right-hand corner. Circle the first and last letter. Write the date under your name.
2. Write your name on the line in the lower left-hand corner.
3. Write your first initial and your last name above the box in the upper left-hand corner.
4. Write your initials in the circle. Underline your last initial.
5. Write your name in capital letters in the boxes in the lower right-hand corner. Use one box for each letter. Color in any empty boxes.
6. Write your last name down the left-hand side and your first name down the right-hand side of the paper. Number each letter in your name.
7. Write your last name to the right of the X. Cross out every other letter.

Teacher option: Have student follow oral directions to
complete a task ____________
go to a location ____________

X

○

First name										
Middle name										
Last name										

____
Last name first

"Following Directions," page 1; Solution, page 191.

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RIDDLE PUZZLE

Name ______________________

Directions:

1. Count 5 rows down. Write the four-letter word starting in the 4th square.
2. Count 5 columns across. Reading down, write the word starting in the 5th square from the top.
3. Find the 10th column across. Write the word starting in the last 4 squares of this column.
4. Write the word made with every other letter in the second row down.
5. Count down to the 5th, 6th, and 7th rows. Write the word made from the 1st letter in each row.
6. Count across to the 9th column. Write the five-letter word that begins with the 1st letter in this column.

Do you know the answer to the riddle? If not, follow these directions.

1. Write the 1st letter in the 2nd row from the bottom.
2. Write the seven-letter word that is in the 4th row down, beginning in the 3rd square.
3. Find the 7th column across. Write the word that begins with the 5th letter in this column.

T	H	I	N	T	S	Q	U	F	E	L
W	O	H	O	E	H	E	T	L	M	S
O	P	E	N	R	G	B	D	I	X	E
Z	E	G	A	R	B	A	G	E	T	R
A	C	O	W	H	A	T	E	S	O	!
N	E	B	S	A	R	R	T	U	V	P
D	L	E	K	S	O	U	P	M	F	E
E	T	R	I	P	L	C	L	A	O	K
A	S	Q	W	A	L	K	O	R	U	N
L	A	W	G	M	A	N	T	K	R	O

Write the words you find here: ______________________

____

____

For fun:
There are at least 21 words hidden in the rows and 21 words hidden in the columns, besides the words you just wrote. Can you find them?

*"Following Directions," page 2; Solution, page 191.

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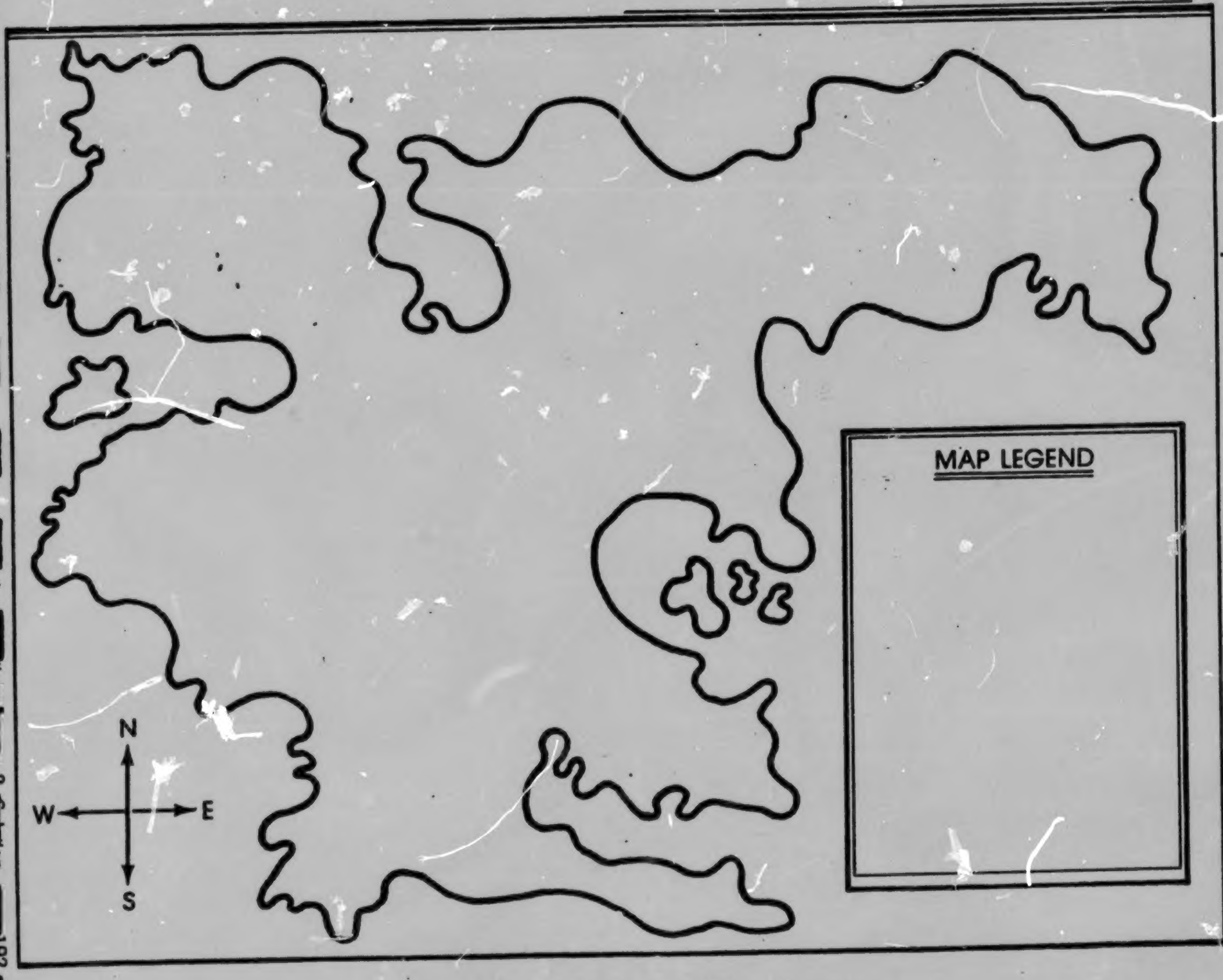
MAP FILL-IN

Name ______________________________

1. Read all the directions below before starting to fill in the map.
2. Use color and symbols to show:
   - a river running from north to south
   - two roads crossing the river
   - two bridges for the roads
   - a large swamp area between the two roads, east of the river
   - an airport in the southeast
   - a town on the western bank of the river, south of the southernmost road
   - a church northwest of the northernmost road
   - a mountain range west of the river
   - a school west of the town
   - two streams running from the mountain range into the river
3. Complete the legend to show what the colors and symbols on your map stand for.



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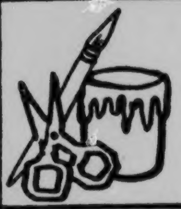
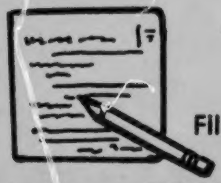
Name ____________________

FOLLOWING DIRECTIONS BY MYSELF

Choose a book or other resource that gives directions for completing these tasks	List the source of the directions you followed	Date completed	Verbs used in the directions
Do a science experiment.			
Cook something from a recipe.			
 Do an arts and crafts project.			
Go someplace using someone else's directions.			
Demonstrate a first-aid procedure.			
 Fill out a form.			

"Following Directions," page 6. Solution, page 192.

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Name ____________________

PASTE-ONS

Paste on a gum wrapper. Put a ring around the name of the gum.

Paste on a wrapper from your favorite candy bar. Circle the longest word on the wrapper.

Paste on a label from something you have worn. Put an X on the capital letters.

Paste on a box top from your favorite cereal. Underline the shortest word.

Paste on an ad for a toy you would like to have. Cross out the letters that are found in your first name.

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Sequential Development in Reading

41

FIRST GRADE

Readiness:

1. *Centers of Interest*:
   Home, play, pets, toys
2. *Auditory perception*:
   - a. Identifying sounds from surroundings
   - b. Identifying initial consonant sounds
   - c. Identifying words that rhyme
   - d. Listening to rhymes and songs
3. *Visual discrimination*:
   - a. Recognizing likeness and differences in shapes, color, size
   - b. Recognizing word symbols
4. *Kinesthetic development*:
   - a. Development of muscular co-ordination
   - b. Development of eye, motor, and voice co-ordination
   - c. Left to right progression
   - d. Holding book
5. *Comprehension and interpretation*:
   - a. Reading pictures
   - b. Story sequence
   - c. Making comparisons
   - d. Noticing details
   - e. Following directions
   - f. Classifying ideas
   - g. Anticipating what happens (What do you think will happen?)
   - h. Making inferences (What did the boys do to the ball?)

Pre-Primer:

1. *Centers of Interest*:
   Pets, toys, home, play
2. *Vocabulary growth*:
   - a. Concept of printed symbols
   - b. Extension of word meanings
   - c. Use of picture, context and configuration clues
   - d. Capital and lower case letters in words
   - e. Recognition of words in isolation
   - f. Using *s* plural forms of nouns and verbs

   Phonetic skills:

   Auditory and visual perception of initial consonants and rhyming words.
3. *Kinesthetic development*:
   - a. Muscular co-ordination
   - b. Eye, motor, voice co-ordination
   - c. Left to right progression
   - d. Coloring, painting, drawing, clay
   - e. Handling books
4. *Comprehension and interpretation*:
   - a. Picture reading
     What is in the picture?
     What are they doing?
     Why is the little girl excited, or sad?
     What do you think the man is saying?
     Color of clothing, hair, eyes, surroundings.
     What time of year is it? How do you know? etc.
   - b. Following directions
     Draw a house ....
     Print directions on strips as "Go to the door."
   - c. Sentence comprehension (match picture and sentence)
     "Read the sentence that says ...."
   - d. Paragraph comprehension
     Children find and read the phrase or paragraph that tells: e.g. The size of the ball (page 12).
   - e. Finding the main idea
   - f. Perceiving story sequence
     What was the first thing that happened? What happened next?
   - g. Noting and remembering details.
     Compare pictures on right and left side of book.
     Close book and think of the things Mary saw., etc.
   - h. Clarification and enrichment of meaning.
     Use pictures and dramatization to develop concepts.
     Real and vicarious experiences
     What have you seen or felt that is like this?
   - i. Making inferences
     This is so because ....
   - j. Identifying the characters.
     What word tells the name of the girl in the story?
     What kind of a girl is she? Why does she do this? How old?
   - k. Recall of events.
     Who ran to meet Mary? What do you think they planned to do?
   - l. Recognizing relationships
     Place first sentence in chart. Children find one

of remaining three sentences that go with first.
Relationships of time, cause and effect, etc.

m. Classification
  Put similar objects in same classifications.
  Lists on board or worksheets, classify pictures.
n. Anticipating outcomes
  Do you think Jack will find the dog? etc.
o. Making comparisons
  How are these the same? Different?
  Comparison of phrases, e.g. a ball — the ball
p. Locating phrases, sentences or words
  Child reads sentence. Show sentence card for each sentence read. Another child reads the sentence on the strip and tells if it is the same as the one read by child from the book.

  Write sentences on the blackboard. Read aloud a phrase in one of them. A child finds the phrase, frames it and underlines it.

  Show the word *ball*. The children find the word in a sentence in the book. A child reads the sentence he finds. Children use words in their own sentences.
q. Evaluating the story
  What did you like about the story?
  Could anything like this happen to you?
r. Making judgments
  What are the reasons?
s. Identifying words in context.
t. Dictionary chart
  (to be read orally.)

  Children choose parts of story they will prepare to read orally

  Title.
  Read the part that tells what Jack wanted to do.
  Read the part that tells what Mary said.
  Read the part that tells what Mary did.
  Read the two pages about Spot.

Primer:

1. *Centers of interest*:
   a. Work and play at home, play with friends.
   b. Experiences with store, zoo, farm, park, airport, etc.
2. *Vocabulary*:
   a. Developing structural analysis skills
   b. Plural ending *s*
   c. Compound words as *snowball, sunshine*, etc.

   Phonetic skills:
   a. Initial consonants, *b, c, d, g, h, l, m, n, p, r, t, w*
   b. Final consonants, *d, l, s, t*
   c. Digraphs *ch, th, wh*
3. *Comprehension and interpretation*:
   a. Phrase and sentence comprehension
   b. Finding the main idea.
   c. Perceiving story sequence.
   d. Reading for details.
   e. Recall of story facts
      Who did the following things:
      ……… went up the hill. ………came to the door, etc.
   f. Perceiving relationships.
   g. Classifying ideas.
   h. Forming judgments.
   i. Making inferences.
   j. Interpretation of pictures.
   k. Using context clues.
   l. Reading for information.
      Who put out the fire? Where did Jack go? etc.
   m. Mental imagery
   n. Purposes for rereading
      Suggest another title for the story.
      Find answers to specific questions.
      Select sentences that describe pictures.
      Describe the character.
      Locate certain information.
      Find sequence of events.
      Prepare for dramatization.
      Compare two episodes.
      Reading aloud.
4. *Rules for an audience*:
   a. Listen closely.
   b. Look at the person reading.
   c. Sit quietly, etc.

First Grade:

1. *Centers of interest*:
   Neighborhood, school activities, park, stores, bus, etc.
2. *Vocabulary*:
   a. Endings of *d* and *ed* for verbs.
   b. Verbs with *ing* forms.
   c. Compound words, possessives.

   Phonetic skills:
   a. Initial consonant *dr, b, pr, st, tr*
   b. Final consonant, *nd, nk, nt, st*
   c. Recognize vowel letter forms *a, e, i, o, u*
3. *Comprehension and interpretation*:
   a. Interpreting use of punctuation marks.
   b. Making inferences.
      Can you think of something else they should do?
   c. Anticipating what will happen.
   d. Making comparisons.
   e. Finding answers.
   f. Using the contents page.
   g. Locating phrases, sentences.
      Find phrases or sentences to answer the questions
   h. Reading to evaluate.
   i. Reading to verify answers.
   j. Association of ideas.
      Words that belong together: ate....bread, hear sound, etc.
   k. Retelling stories.
   l. Opposites.

Use words in reader, e.g. cats, cow, ducks: apple, berries, etc.

- m. Classifying words
- n. Reading to dramatize.
- o. Learning that words have different meanings. well, rock, run, box, trip, kind, etc.
- p. Locating story details.
- q. Grouping of related ideas.
- r. Verifying facts.
- s. Anticipating what will happen.

SECOND GRADE

1. *Vocabulary:*
   - a. Clarifying and extending word meanings
   - b. Using picture and context clues.
   - c. Recognizing words of similar and opposite meanings.
   - d. Recognizing variant meanings of words.
   - e. Recognizing root forms.
   - f. Using *es* forms of nouns and verbs.
   - g. Using *er* and *est* forms of words.
   - h. Changing *y* to *i* before adding endings.
   - i. Possessives and contractions.

   Phonetic skills:
   - a. Initial consonants, final consonants.
   - b. Changing *y* to *i* before adding endings.
   - c. Consonant blends.
   - d. Long and short sounds of vowels.
   - e. Diphthongs.
   - f. Identifying silent consonants.
2. *Comprehension and interpretation:*
   - a. Phrase and sentence comprehension.
   - b. Paragraph and story comprehension.
   - c. Finding the main idea.
   - d. Reading for details.
   - e. Perceiving story sequence.
   - f. Following directions.
   - g. Perceiving relevant ideas.
   - h. Classifying and summarizing ideas.
   - i. Perceiving cause-effect relationships.
   - j. Forming judgments.
   - k. Making inferences and drawing conclusions.
   - l. Predicting outcomes.
   - m. Evaluating literary characteristics.
   - n. Discriminating between conversation and narrative.
   - o. Discriminating between fact and opinion, realism and fancy.
   - p. Locating answers to questions, locating information.
   - q. Finding proof.
   - r. Locating sentences.
     Children read aloud from their books the sentences that answer questions listed on blackboard or paper.
   - s. Using the contents page.
   - t. Descriptive words.
     List words. Children give the name of the person or thing each one describes, e.g. quiet, loud, brave, etc.
   - u. Recall of story detail.
   - v. Classifying words.
   - w. Context clues.
   - x. Anticipating what will happen.
   - y. Locating quotations.
     e.g. "I see a light in the window."
   - z. Association.

     The sun is shining.
     The rain is falling. etc.

THIRD GRADE

1. *Vocabulary:*
   - a. Using meaning clues.
   - b. Recognizing words of similar and opposite meanings.
   - c. Recognizing variant meanings of words.
   - d. Recognizing shades of meaning of words.
   - e. Recognizing homonyms, synonyms, antonyms, root word forms.
   - f. Using apostrophes.
   - g. Using hyphenated words.
   - h. Using prefixes *a*, *be*, *un*.
   - i. Using suffixes *en*, *er*, *est*, *ful*, *ish*, *ly*, *y*.
   - j Recognize syllables in words.

   Phonetic Skills:
   - a. Recognize hard and soft sound of *c* and *g*.
   - b. Final and initial digraphs and blends.
   - c. Long and short vowel sounds.
   - d. Diphthongs.
   - e. Determining vowel sounds by position in words.
   - f. Identifying silent consonants and vowels in words.
2. *Comprehension and interpretation:*
   - a. Phrase, sentence, paragraph and story comprehension.
   - b. Finding main idea.
   - c. Reading for details.
   - d. Perceiving sequence.
   - e. Recalling story facts.
   - f. Following directions.
   - g. Forming opinions, making judgments.
   - h. Making generalizations.
   - i. Noting variety in literary thinking.
   - j. Critical thinking, creative thinking.
   - k. Characteristics of folk tales, fables.
   - l. Perceiving relevant ideas. Checking comprehension and memory.
   - m. Classifying and summarizing ideas.
   - n. Verifying conclusions.
   - o. Visual imagery.
   - p. Clarifying and expanding concepts, clarifying meaning.
   - q. Unusual expressions.
   - r. Making inferences and drawing conclusions
   - s. Perceiving cause-effect relationships.
   - t. Predicting outcomes.

u. Discrimination between realism – fancy; fact – opinion.
v. Recognizing contradictory statements.
w. Recognizing organization of content materials.
x. Reference material, locating information in books, card catalog.
y. Integrating new ideas with past experience. Extending interpretation.
z. Alphabetizing.
a′. Research.
b′. Noting the use of figurative speech.
c′. Impersonations.
d′. Noting emotional aspects, noting mood.
e′. Author.

FOURTH GRADE

1. *Vocabulary*:
   Continue with suggestions in previous grades.
2. *Interpretation and comprehension*:
   a. Sensing broader meanings.
   b. Selecting relevant ideas.
   c. Skimming.
   d. Alphabetizing.
   e. Using diacritical marks.
   f. Developing concepts of time.
   g. Establishing authenticity of material.
   h. Using the glossary.
   i. Reading to find the general idea.
   j. Making critical interpretation.
   k. Locating the setting.
   l. Finding proof.
   m. Reading to locate information.
   n. Synonyms, homonyms, antonyms.
   o. Interpreting idiomatic expressions, colloquialisms, figurative speech.
   p. Seeing deeper implications.
   q. Clarifying ideas.
   r. Applying understandings. Comparing differences between present and past.
   s. Summarizing.
   t. Reading to identify evidence.
   u. Visualization, forming sensory images.
   v. Predicting outcomes.
   w. Recalling details.
   x. Following directions.
   y. Appreciating artistry of style.
   z. Integrating new ideas with past experiences.
   a′. Classifying ideas.
   b′. Forming opinions.
   c.′ Analyzing conclusions.
   d′. Interpreting colorful expressions.
   e′. Understanding abstract terms.
   f′. Cause and effect.
   g′. Fusing ideas gained through reading.
   h.′ Identifying good words, prefixes, and suffixes.
   i′. Using the glossary.
   j′. Summarizing sequence of events.
   k′. Sensing implied meaning.
   l′. Making critical interpretations.
   m′. Knowing compound words.
   n′. Deriving meaning from context.
   o′. Using syllabication principles.
   p′. Judging validity of material.
   q′. Outlining.
   r′. Finding informational details

FIFTH AND SIXTH GRADE

1. *Comprehension and interpretation.*
   a. Finding the main idea.
   b. Making comparisons.
   c. Outlining.
   d. Learning about the author.
   e. Classifying terms.
   f. Distinguishing syllables.
   g. Fusing ideas gained through reading.
   h. Using table of contents, section title.
   i. Indexing.
   j. Matching words with meaning.
   k. Heteronyms–a tame dove–dove into woods.
   l. Forming opinions.
   m. Association of ideas.
      e.g. charm–something worn to keep away ill fortune.
   n. Appreciation of style.
   o. Alliteration. e.g. each word in sentence begins with same letter.
   p. Figurative speech.
   q. Critical thinking.
   r. Making comparisons.
   s. Seeing deeper implications.
   t. Reading to answer specific questions.
   u. Analysing conclusions.
   v. Knowing about authors.
   w. Matching ideas and paragraphs.
   x. Skimming to find details.
   y. Drawing conclusions.
   z. Noting character traits.
   a′. Drawing inferences.
   b′. Verifying statements.
   c′. Finding the climax; determining the plot.
   d′. Summarizing.

1. Sequence of Events

Grades five and six

Discuss the use of certain words in learning the sequence of events. There are certain words, called qualifying words, that can help the student discover the sequence more easily. Some of the words are *first, then, next, in the meantime, when, while, after that, and then, at last,* and *finally.*

If the students know when the story took place, whether it was yesterday, ten years ago, or a hundred years ago, they will understand the selection better. Customs and ways of living change, and if they know the people they are reading about lived a hundred years ago, they will know why they acted, talked, lived, and dressed as they did.

Usually the reader can follow the sequence of events without too much difficulty. The author usually tells each thing in the order that it happens. It is like stringing beads on a thread. When the beads are all strung, you can see the pattern of the beads plainly.

However some writers do not make it that easy. They skip from one thing to another and it takes careful reading to follow the correct sequence.

Exercises in making time charts in social studies may prove to be a valuable activity in developing awareness of the sequence of events.

2. Finding the Sequence

Grades five and six

Prepare stories that have established sequences and ask the students questions pertaining to them.

Example: In 1920, the New York Fair opened; Joe Brown had just finished painting the sign for his ice-cream parlor, and he felt that he had picked the right spot because the people who were on their way to the Fair, or on their way out, would pass by his little place.

More and more people stopped to buy ice-cream sandwiches, and Joe and his sister were kept very busy making sandwiches by spreading ice-cream between waffles. There was no competition for them, and they felt very fortunate.

Then one day, they noticed some men putting up a building across the street. Then they saw a sign go up, "Ice-Cream Palace." Joe and Rose were afraid they were going to lose some of their business to the new place.

That same day, Joe brought Rose a small bunch of flowers. Rose wondered where she could put the flowers, and then her eyes fell on a waffle. Rose rolled the waffle into a cone and put a little water in it.

Rose didn't want to waste the other half of the waffle so she rolled it into a second cone and put some ice-cream into it and ate it. Here was a new idea! And it would take less waffles to make their ice-cream sandwiches if they used just a half a waffle and rolled it into a cone!

They began calling their new idea "ice-cream cones" instead of ice-cream sandwiches. The cones were talked about by everyone at the New York Fair. The people liked them much better than sandwiches because the ice-cream did not drip out of them.

The Ice-Cream Palace across the way began having fewer customers, and so the man who owned it stopped by to see Joe one afternoon. He said it was the ideas that count if you plan to succeed.

a. Underline the words that helped you find the proper order of events.

b. How long did this event take place? ......
....

c. What words are not used very often today?
....

d. How much do you think the ice-cream cones cost at that time? ....

e. What is the meaning of the word *competition?* ....

f. What is the opposite of *fortunate?* ....
....

U

Skills in Reading

42

It is important that children learn to develop the various reading skills in order to read effectively. The skills listed below can be developed through the suggested activities given in this book.

I. SKILLS IN WORD RECOGNITION

1. Context clues (meaning from sentence)
2. Configuration (look at shape of word)
3. Structural analysis (roots, prefixes, syllables, base words, compounds)
4. Phonetic analysis (sound elements)
5. Dictionary usage (final answer)

II. SKILLS OF MEANING (Comprehension and Interpretation)

1. Get central idea of selection
2. Study organization
3. Use mental imagery (wire for sound — color)
4. Relating ideas in own words
5. Characterizing
6. Judging
7. Inferring
8. Generalizing
9. Predicting
10. Skills of oral interpretation
11. Making conclusions
12. Proving conclusions
13. Reflective thinking
14. Seeing relationships
15. Listing ideas in sequence
16. Application — solving and constructing
17. Organize facts to support a conclusion
18. Associate related ideas
19. Identify important and unimportant details
20. Relate to own experiences
21. Read between the lines

III. STUDY SKILLS

1. Finding and selecting information for specific questions or problem
2. Organizing (topic sentence, main and subpoints)
3. Locating information
    a. Different types of books
        ....textbooks, encyclopedias, atlas, yearbooks, bound volumes
    b. Library
        ....card catalog
        ....Reader's Guide
    c. Parts of book
        ....table of contents
        ....index and glossary
        ....maps, charts, graphs
        ....topical headings
        ....copyright page to determine recency
        ....footnotes
    d. Dictionary
        ....use guide words at top of dictionary page
        ....abridged and unabridged
4. Following directions
5. Retaining and remembering
6. Skimming to find the answer

IV. SKILLS OF APPRECIATION

1. Appreciating types — poetry-prose, new, old, factual, political, humorous, argumentative, fictional
2. Style-manner of speech, period written, rhythm, visual clarity, words used
3. Quality — truth of life, author's purpose, fundamental honesty, factual

V. RETENTION OF IDEAS

1. Choose ideas to remember
2. Express accurately
3. Summarize
4. Outlining

VI. EVALUATION

1. Judging statements of importance
2. Evaluate for completeness, organization, clarity, style
3. Study guide words
4. Check printed statement
5. Difference between fact and opinion
   Use of clue words: "It has been reported," "Many people believe"
6. Examine your impression as a whole
7. Evaluate accuracy of author's logic

Types of Reading

46

I. Developmental Reading
1. Vocabulary development
    - ....through context
    - ....structural analysis
    - ....phonetic analysis
    - ....dictionary
2. Comprehension and interpretation
    - ....grasping inferred ideas
    - ....recognizing fact or opinion
    - ....interpretation of ideas
    - ....visualizing content
3. Evaluating and organization
    - ....drawing and proving conclusions
    - ....classifying
    - ....choosing main idea and supporting details
    - ....relating associated ideas
    - ....summarizing
    - ....outlining
4. Retention
5. Oral reading abilities
    - ....enunciation and pronunciation
    - ....fluency
    - ....interpretation
6. Mechanical make-up of book
7. Appreciation

II. Work Type Reading
1. Interpretation
2. Locating information
3. Following directions
4. Use of workbooks; exercise sheets; contracts
5. Read to find the answer
6. Read to help solve problems

III. Functional Reading
1. Development of ability in content fields
2. Technical vocabulary
3. Graphs, charts, maps, etc.
4. Development of units of work
5. Finds answers — solves problems

IV. Assimilative Reading
1. Children make their own
    - ....charts, posters, scrapbooks, stories, etc.

V. Recreatory or Independent Reading
1. Read for pleasure and enjoyment
2. Extension of experiences
3. Escape or fantasy
4. Materials easy and well illustrated
5. Bulletin boards
6. Contract reading
7. Library experience

VI. Critical Reading
1. Evaluation
2. Selection
3. Find specific purpose
4. Formulation of opinions
5. Organization of ideas

VII. Locational Reading
1. Ability to locate information
2. Skimming for certain facts.

VIII. Selective Reading
1. Children read graded material at instructional level
2. Teacher evaluates reading

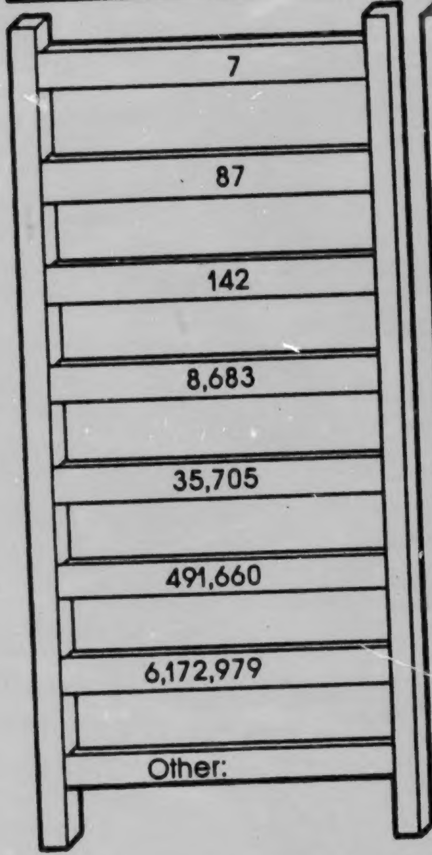
Name ______________________

READING AND WRITING NUMERALS

To do with the teacher:
The teacher will check the numerals as you read them from the first ladder.
A new set of numerals will be dictated for you to write on the second ladder.

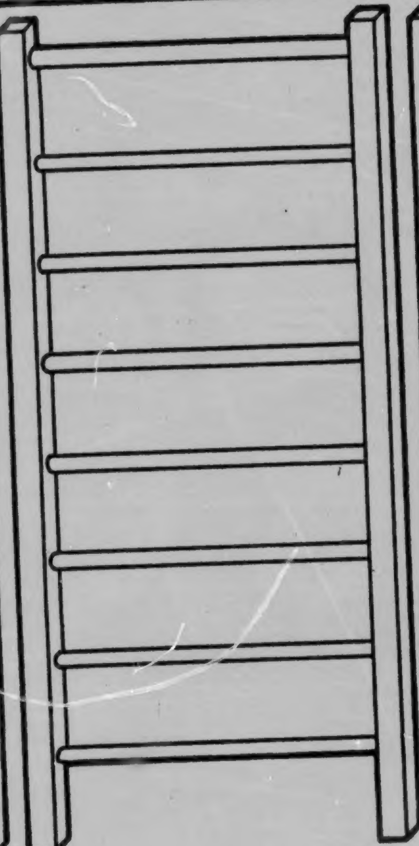
To do by yourself:
Complete these tasks by yourself.

READING NUMERALS

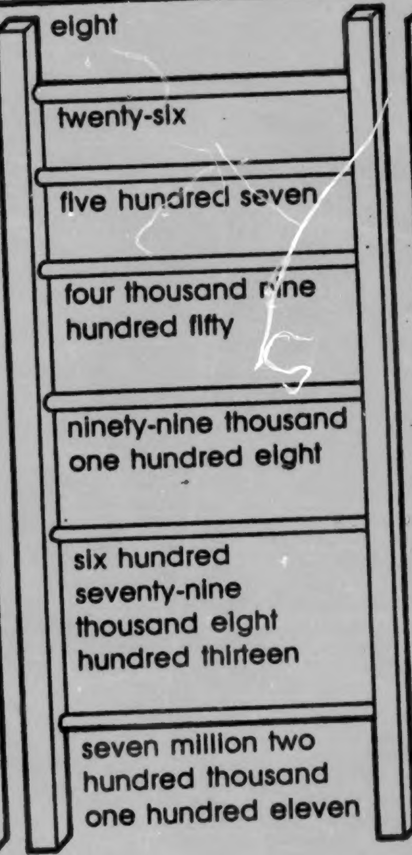


- 7
- 87
- 142
- 8,683
- 35,705
- 491,660
- 6,172,979
- Other:

WRITING NUMERALS

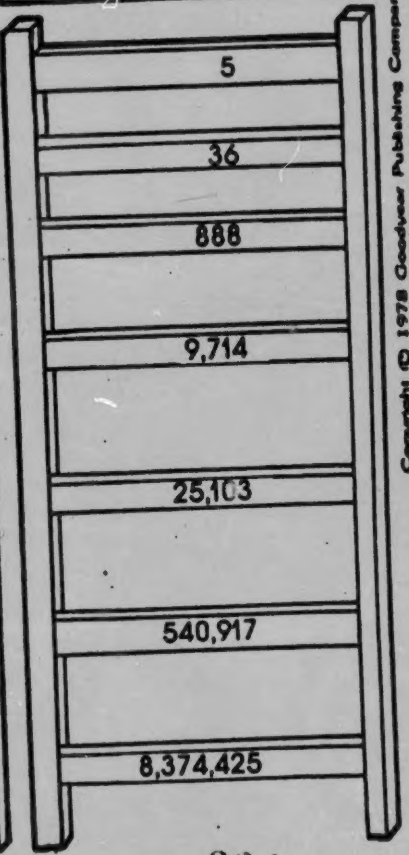


READ THE WORDS AND WRITE THE NUMERALS IN THE SPACES



- eight
- twenty-six
- five hundred seven
- four thousand nine hundred fifty
- ninety-nine thousand one hundred eight
- six hundred seventy-nine thousand eight hundred thirteen
- seven million two hundred thousand one hundred eleven

READ THE NUMERALS AND WRITE THE WORDS IN THE SPACES



- 5
- 36
- 888
- 9,714
- 25,103
- 540,917
- 8,374,425

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"Reading and Writing Numerals," page 7; Solution, page 192.

SENTENCE EXPANDER

Name ______________________________

Example:
Expand sentences. You can expand sentences. You can expand sentences to make them more interesting.

Directions:
Read sentence 1 in part A. In the empty boxes write two words to tell what kind of monster.
In sentence 2, the new words you add will tell what kind of boy.
In sentence 3, your new words will tell where the monster was or what the monster was doing.
Expand the sentences in parts B and C, just like you did in part A.

A

1 The boy saw a	___ ___ what kind of?	monster.			
2 The	___ ___ what kind of?	boy saw a	___ ___ words from sentence 1	monster.	
3 The	___ ___ words from sentence 2	boy saw a	___ ___ words from sentence 1	monster	___ ___ ___ where? or doing what? .

C

1 People are funny.				
2 ___ what kind of?	people are	___ how?	funny.	
3 ___ what kind of?	people are	___ word from sentence 2	funny	___ ___ ___ ___ ___ why? .

B

1 The sun came up	___ ___ where or when? .			
2 The	___ ___ what kind of?	sun came up	___ ___ words from sentence 1 .	
3 ___ ___ ___ when? or where?	the	___ ___ words from sentence 2	sun came up	___ ___ ___ words from sentence 1 .

225

226

"Writing Sentences," page 39; Solution, page 196.

PARTS OF SPEECH

To the teacher:
Write in an appropriate sentence.

DIAGNOSTIC SENTENCE: ______________________________

____

Have each student read the sentence. Then ask the child to point out a noun, tell what a noun does, and give several examples of other nouns. Check for understanding of other parts of speech in the same manner.

STUDENTS' NAMES	DATE	NOUN			ADJECTIVE			VERB			ADVERB			OTHER		
		Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples

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"Parts of Speech," page 49

Name ____________________

PARTS-OF-SPEECH DOMINOES

Directions:

1. Cut out the word dominoes.
2. Paste them in the space below in a domino pattern. The sides of the dominoes that touch must be the same part of speech—noun, verb, adjective, or adverb.
3. On the blank half of any domino write in a word to make the parts of speech match.

*"Parts of Speech," page 50; Solution, page 198.

START HERE:

big	sing

swim		tree		gaily	
	blue	sun		down	
very		man		that	

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Main Idea/Summarizing, page 67; Solution, page 200.

MAIN IDEA

Name ______________________________

I. Fill in the bubble that names the letter of the topic sentence.

A B C D E
○ ○ ○ ○ ○

A There are many different kinds and locations of homes. B Some homes are small. C Some homes are big. D Some homes are near the city. E Where do you live?

II. ✓ the number that matches the topic sentence.

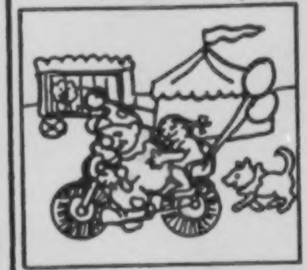
___1 ___2 ___3 ___4

1 The rose is a flower that is often used for corsages. 2 The chrysanthemum is a flower that is eaten. 3 Some flowers are used to make teas. 4 Flowers are used for a variety of purposes.

III. Write the letter that names the topic sentence. ________

a Cinderella was crying. b Her stepsisters were angry. c Everyone in the house was upset. d The cat was running around. e The dog was barking.

IV. Write or tell your teacher the main idea of the picture in your own words.



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V. Write the main idea of the story in your own words.

____

____

____

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____

____

____

Mary had a dog as a pet. They played together. They watched TV together. They went everywhere together.

VI. List the key words of the paragraph below. ______________________

____

____

____

Names of fish often give clues to their many different shapes and colors. There are yellow-tail tunas and pink salmon. Can you guess the shapes of the pipefish and the hammerhead shark?

To the teacher:
Check the appropriate column to indicate the student's performance on these main-idea exercises.

	ITEM	RESPONDED APPROPRIATELY	NEEDS PRACTICE
	Locates topic sentence in context (I, II, III)		
	States main idea from picture or paragraph (IV, V)		
	Identifies key words (VI)		

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PREFIXES AND SUFFIXES

Assess the children in a group activity, such as Pass the Hat (page 65), in the following way:

⧄ not introduced to skill
◩ working on the skill
■ mastery of the skill

STUDENTS' NAMES	Identifies prefixes in words	Defines prefixes	Gives words containing prefixes	Defines words containing prefixes	Uses words containing prefixes in a sentence	Knows these prefixes:	Identifies suffixes in words	Defines suffixes	Gives words containing suffixes	Defines words containing suffixes	Uses words containing suffixes in a sentence	Knows these suffixes:
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	

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"Prefixes and Suffixes," page 61.

1

INSTRUMENTAL ENRICHMENT AND THE CONCEPT OF COGNITIVE MODIFIABILITY

Instrumental Enrichment is presented in this book as a strategy for the redevelopment of cognitive structure in the retarded performer. It is designed as a direct and focused attack on those processes that, because of their absence, fragility, or inefficiency, are responsible for poor intellectual performance, irrespective of underlying etiology.

The aim of the Feuerstein Instrumental Enrichment (FIE) program is to change the overall cognitive structure of the retarded performer by transforming his passive and dependent cognitive style into that characteristic of an autonomous and independent thinker. It is our view that both the low level of scholastic achievement and the low level of general cognitive adaptation of the retarded performer, especially among socioculturally disadvantaged adolescents, are a product of a lack of, or inefficient use of, those functions that are the prerequisites to adequate thinking.

The Instrumental Enrichment program is addressed not to any specific skill or content area but to the *process* of learning itself. For this reason, the various components of the program have been deliberately called "instruments" and the entire program "Instrumental Enrichment." The contents around which each instrument is built serve only as a vehicle for the development, refinement, and crystallization of the functional prerequisites of thinking. Implicit in the conception of Instrumental Enrichment is the conviction that manifest low cognitive performance need not be regarded as a stable characteristic of an individual and that systematic intervention, directed at the correction of deficient functions, will render the condition reversible by producing a change in the cognitive structure of the individual.

ASSUMPTIONS UNDERLYING THE INSTRUMENTAL ENRICHMENT PROGRAM

Clearly, as an approach to the problem of retarded cognitive performance, Instrumental Enrichment represents an active-modification approach as opposed to one of passive acceptance (Feuerstein, 1970). Characteristic of the former approach is the goal of changing the individual by providing him with the means of successfully adapting to his environment. In contrast, the passive-acceptant approach contents itself with changing the environmental conditions to suit the low level of performance of the retarded individual. Each of the above broad approaches is governed by a number of fundamental assumptions that find expression in the nature of the diagnostic tools used for assessing an individual's performance; in the procedure of classifying and labeling him; in the provision of treatment and training; and in the expectations for his future development leading to the establishment of educational, occupational, and general adaptational goals.

At the heart of the matter is the issue of whether the organism is viewed as an open or closed system, since the implications of this view are far-ranging. Advocates of the active-modification approach view the human organism as an open system that is receptive to change and modification. In this framework, modifiability is considered to be the basic condition of the human organism, and the individual's manifest level of performance at any given point in his development cannot be regarded as fixed or immutable, much less a reliable indicator of future performance. Tangible expression of this viewpoint is evident in the rejection of IQ scores as reflective of a stable or permanent level of functioning. Instead, and in accordance with the open system approach, intelligence is considered a dynamic self-regulating process that is responsive to external environmental intervention.

In contrast, when intelligence is conceptualized in quantitative terms, as a fixed product of ability that is constant across the entire life span of the individual, the natural outcome is a passive-acceptant approach. Attempts to modify an individual's course of development are thus regarded as futile and even as unfair because they demand the "impossible" from the child. The extent to which any gaps in the closed system are plugged is reflected in the common practice, leading to a tautological way of thinking, of confirming the observed low level of manifest performance by the use of tests especially designed to measure such performance. The child's low achievement at school is confirmed by his poor performance on an IQ test, and he is then classified, labeled, and treated accordingly.

The assumption that the human organism is open and amenable to change demands a very different method of assessment and evaluation, the purpose of which is to evaluate the individual's capacity to learn and, hence, to become modified. Thus, the purpose of assessment is to reveal the potential of the individual and identify the deficient processes that may be impeding development. Treatment may then be directed at the correction of deficiencies, as a result of which the individual will be able to alter the course of his development.

The aim of the Instrumental Enrichment program is to modify the individual rather than the environment. To appreciate this process-oriented approach, it is important to specify the nature of the changes that the program is intended to produce. We have selected the term "cognitive modifiability" to convey the idea of a process of autonomous and self-regulated change set into motion by this program. In the retarded performer, the first step in the process of reversing his low manifest level of performance is to effect a diversion from his current pattern of development. This necessitates an active interaction between the individual and sources of external and internal stimulation. Once activated, the dynamics of modifiability propel the individual along a course of development that could not be anticipated on the basis of his previous performance. In Chapter 2 consideration is given to the factors that contribute to the differential development of cognitive modifiability, but even before considering the issue in detail it must be emphasized that cognitive modifiability is a product of highly specific experiences and learning. In general terms, it is a means of adapting to the environment. The survival of any organism depends on its ability to adapt. For the human organism, successful adaptation involves the ability to respond not to a constant and stable environment but to situations and circumstances that are constantly changing.

In describing the adaptational mechanisms of the human organism, Freud (1924) distinguished between alloplastic and autoplastic responses to changes in the environment. Adaptation of an alloplastic nature is directed at modifying the external environment. It is the force behind man's need to conquer nature and harness its resources to meet humanity's needs. It is also reflected in various forms of aggressive behavior in which situations perceived as threatening may be neutralized by attacking the source of danger. On its own, successful alloplastic response is limited to those situations in which environmental change is possible. In many instances, however, it is the individual himself who must adapt to external reality. Such changes constitute an autoplastic means of adaptation and are reflected in a state of internal flexibility that enables the individual to cope with sudden and novel changes in the environment. Autoplastic adaptation depends heavily on the presence of adequate cognitive processes and autonomous exercise of control over those functions that render the cognitive system flexible and constantly modifiable. In terms of adaptation, it is the autoplastic changes that are crucial. The extent to which external changes may be brought about is contingent upon the organism's ability to initiate such changes.

It should now be evident that when we speak of cognitive modifiability we are concerned not with the acquisition of bits and pieces of knowledge or the mastery of specific academic or vocational skills but with, in the broadest sense, the ultimate destiny of the retarded performer. Adequate cognitive functioning has implications that reach far beyond the academic requirements of the school or formal educational system. Although a mastery of the "three Rs" is a necessary prerequisite for integration into modern technological society, success in such a social framework depends on the ability of the individual to use his own resources in drawing inferences, making decisions, and planning ahead to anticipate future contingencies. Because of the social and cultural discontinuity that marks today's society, the individual can no longer rely on an established order or traditional patterns of behavior. Greater social, political, economic, and religious freedoms place a heavy burden of responsibility on the individual. Decisions must be made concerning employment, use of leisure time, political and religious affiliations, morality — in short, individual destiny is today, more than ever before, in the hands of the individual himself. Without the necessary cognitive tools, the individual cannot carve a future that will enable realization of his potential for growth.

COGNITION AS THE DETERMINANT OF BEHAVIOR

Even today, in spite of the unparalleled commitment to education as a means of transforming society, it is still often necessary to justify an approach that regards cognition as the focal point of successful adaptation. A number of interrelated factors contributed to the previous neglect of the cognitive processes both as a field for scientific investigation and as a guide for educational principles and practice. Although at the turn of the century cognition was considered the main determinant of behavior by the Denk psychology of the Wurtzberg School, its preeminence was eclipsed by three major forces that have had, and continue to have, a powerful influence on psychology and education. These are the psychoanalytic, the behaviorist, and the psychometric schools of thought.

Psychoanalysis

The dynamic psychoanalytic approach, initiated by Freud, was an attempt to explore the unconscious affective determinants of behavior. Theorists of this school often maintained that behavior is a function largely of non-intellectual factors that may bypass or even neutralize cognitive processes. It was even argued that cognition is determined by unconscious emotional processes and that the latter should be regarded as the primary force rather than solely as an energizing or motivational factor in behavior. This one-sided emphasis on the primacy of emotional factors probably arose because the neurotic behavior that psychoanalysis intended to explain was almost exclusively manifest in a very selective group of individuals who had attained high levels of cognitive articulation. Thus, the conclusion was drawn that, because their cognitive abilities and skills in logical thinking had not prevented the occurrence of neurotic, irrational, infantile, and regressive behavior, cognitive factors should be assigned a secondary role in determining behavior. However, for the majority of children whose behavior is maladaptive, cognitive impairment cannot be relegated to a secondary role. The major determinant of their inability to adapt is a low level of cognitive functioning. Psychoanalysis tended to ignore this fact because very few children, and even fewer adults, functioning at low cognitive and intellectual levels, ever came to the attention or treatment of dynamically oriented theoreticians. In fact, the retarded child was considered immune to neurotic disturbances because of his low level of functioning and lack of personality differentiation.

In a study conducted with culturally different and socioculturally deprived adolescents immigrating to Israel from North Africa (Feuerstein, Richelle, and Jeannet, 1954), we were able to establish that the subjects' considerable maladaptive behavior was primarily a function of inadequate cognitive processes. Because of a lack of the requisite cognitive tools, these children, when confronted with a different and unfamiliar dominant culture, were unable to understand, learn, or become modified in order to adapt to their new environment. Their reactions were certainly determined by anxiety, but, as our tests revealed, their aggressive and impulsive behavior was not produced by neurotic or repressive tendencies. Rather, the anxiety was provoked by a state of cognitive disorientation. These adolescents were unable to understand the nature of their new environment, its social organization, and the roles played by their various caregiving personnel. They were unable to predict the outcome of their behaviors in novel situations, and this, combined with a failure to grasp abstract concepts, produced a state of tension in which the worst was always anticipated. Hence, the high levels of anxiety among this group of adolescents were primarily caused by their inability to adapt to the new environment and culture in which they found themselves. The problem was one of a lack of the necessary cognitive equipment to cope with reality. This, in turn, may have produced personality disorders, but they were the *result* and not the cause of the individual's inability to organize, integrate, and relate to his environment.

Whatever its merits, the psychoanalytic approach has exerted considerable influence on education, especially at the preschool and primary grade levels. For many years emphasis was placed on the emotional determinants of behavior, at the expense of the cultivation of cognitive processes, instead of taking a balanced approach that recognized that difficulties in either the cognitive or the emotional realm could produce concomitant problems in the other.

Behaviorism

Whereas psychoanalysis attempted to penetrate the depths of the "black box" of the mind, behaviorism emerged as a reaction against any form of introspection and "outlawed" the concept of mind. Only those behaviors directly observable were regarded as worthy of scientific endeavor. Thus, with a single stroke, behaviorism effectively removed from psychology the entire apparatus of man's capacity to think and reason. The notion that man's behavior could ultimately be explained by a psychology built on the principle of association, with observable stimuli and responses as its sole source of information, hampered our understanding of cognition. Until recently, little attempt was made within the behaviorist tradition to understand the underlying structure and function of thought. As a consequence, for many years experimental psychology was simply irrelevant for education. This also may have indirectly contributed to an uncritical acceptance of psychoanalytic theories by educationalists.

Modern behaviorist approaches, usually referred to as behavior modification, have been applied to educational problems and warrant merit for their expression of an optimistic attitude toward the possibility of change. But, because of the essential philosophy underlying the theory and practice of behavior modification, both the problems and the solutions concerning inadequate cognitive performance are conceptualized in terms of specific behavioral patterns. Intervention programs are directed at the end products of cognition and not at the processes that govern and determine the nature of the output. Thus, programmed learning, teaching machines, and verbal training are all efficient means of transmitting specific contents. But directing attention to the operation of the mental processes responsible for the mastery of any content area or skill is still assiduously avoided, and, although the "black box" is occasionally tampered with, the "lid" on cognition has not been lifted.

Psychometry

The third major force contributing to the limited attempts to influence the cognitive development of the child was the rise of the testing movement in psychology and education. Whereas psychoanalysis was directed at the treatment of neurosis, and behaviorism was concerned with methodological issues, the psychometric approach was associated from its inception with educational issues. The focus was the issue of prediction; yet, despite advances in statistical techniques, the underlying structure of IQ tests remains unchanged. The IQ test, constructed to yield a measure of the individual's manifest level of performance, is based on those very characteristics that are most likely to remain stable and constant over time. It is not necessary to document the extent to which IQ tests have permeated the entire educational and vocational system and become entrenched in it. Whatever reticence education may have had toward the adoption and application of psychological theories, its acceptance of the IQ test as the major assessment tool of educability, trainability, and general intelligence level has been almost total. The great paradox is that to this very day we still do not have any real understanding of what the IQ test measures; herein lies its great potential for abuse within education.

THE CONCEPT OF INTELLIGENCE

Because a score is obtained with the IQ test, the assumption is made that we are measuring an entity. The idea that this entity can be measured suggests that it is a fixed and immutable element. This attitude is further strengthened by the deliberate effort to eliminate from IQ tests those items that address the characteristics of an individual's functioning that are subject to change and to retain only those questions directed toward characteristics that are most resistant to change and demonstrate stability over time. Consequently, the IQ score reflects the *product* of a given quantum of ability. It does not tell us anything about the underlying *processes* responsible for an individual's performance or about the individual's capacity to improve it. In short, the IQ test may provide an indication of what has been learned in the past; but how the learning took place and whether an individual has the potential to improve his learning ability are not questions that can be answered by studying an IQ score. Yet questions such as these are of crucial importance in education, especially in relation to the retarded performer.

In recent years, there has been a shift away from the product-oriented approach toward a more process-oriented conception of intelligence. In discussing the concept of intelligence, McCall, Hogarty, and Hurlburt (1972) have commented:

> One may need to discard the reified notion of intelligence as an unchanging characteristic that governs nearly all of an individual's mental performance at every age. Despite the incredibly pervasive and restrictive character of its assumption, psychologists have apparently been willing to make it, explicitly or implicitly, throughout most of modern psychological history (p. 728).

Considering the above, it is not surprising that IQ testing has become deeply embedded in the entire rubric of education to the extent that cognitive processes have been largely ignored and certainly neglected.

The neglect of cognitive processes has conspired to produce a widespread belief that intelligence is something that one either has or does not have and that attempts to change the structure and course of intellectual development are futile, if not impossible. In the case of psychoanalysis, efforts at modifiability focused on personality changes. The assumption was that cognitive change was irrelevant to the emotional life and stability of the individual and, furthermore, was less attainable. Within the behaviorist framework, cognitive modifiability, directed toward internal structural changes, could not be contemplated because underlying mental processes were regarded either as scientific fictions or as inaccessible to control. But the case against cognitive modifiability was most strongly expressed by the psychometric approach, which placed considerable emphasis on the genetic determinants of intelligence, the level of which was fixed and not amenable to concerted efforts at modifiability.

This previous absence of a viable theory and approach to confronting the problems of cognition perhaps should be regarded as a further negative force in the conceptualization and understanding of intelligence. In recent years, however, cognition has increasingly received the attention of psychologists. The static, quantitative conception of intelligence has been challenged from many quarters. Probably the most cogent attack has emanated from the work of Piaget, whose writings have simultaneously provided a counterforce to psychoanalysis, behaviorism, and the psychometric approach to intelligence. Not only does Piaget's theory redress the overemphasis of psychoanalysis on the unconscious emotive aspects of thought and provide a scientific alternative to behaviorism, but it also has demonstrated that the essence of intelligence lies not in its measured product but in its active construction by the individual. Although Piaget's theory does not provide all of the answers for education, it has exposed the myth that intelligence is fixed at birth, and it has dramatically shifted attention away from the static and sterile concept of IQ toward a dynamic process-oriented approach to cognition.

THE ETIOLOGY OF RETARDED PERFORMERS

Many different reasons, ranging from genetic to environmental factors, have been suggested to explain low cognitive performance. A progression of pessimism regarding cognitive modifiability is associated with the proposed etiologies. On the one extreme is the approach of Jensen (1969, 1973), who holds that low cognitive performance is largely genetically determined, and therefore inaccessible to modification. Jensen has proposed a dichotomous model of intelligence in which humanity is divided on the basis of genetic endowment into two different categories: people whose capacities are limited to simple mental acts of an associative and reproductive nature, referred to as Level I type of intelligence, and people who are able to use complex transformational, operational, and abstract processes, referred to as Level II type of intelligence. In terms of this dichotomy, Jensen suggests that we should accept the limits imposed by heredity and accordingly set limited educational goals for individuals with Level I intelligence. This orientation is totally at variance with that embodied in our general approach and, in particular, with the Instrumental Enrichment program. The focal question is whether it is possible to derive an approximation of heritability from data that, at best, represent a manifest level of functioning determined from the static "inventories" of abilities reflected by IQ tests (see Feuerstein, 1979). We maintain that it is more appropriate to regard genetic factors as producing variations in the level of responsiveness of the individual to learning situations that may require corresponding variations in the quality and quantity of investment necessary for growth.

At the other end of the scale we encounter the notion of the "six-hour retarded child." In this case, the failure of the retarded performer is considered a function of demands imposed by an academically oriented and alien school system. This approach, which is characteristic of the "cultural difference" etiological position, implies that merely altering the environment will bring about the desired change or eliminate the apparent poor performance of the individual. It represents a gross oversimplification of the problem and

fails to recognize that deficient cognitive functioning is neither culture bound nor limited to specific school skills. On the contrary, even if the "three Rs" of education have been mastered, a lack of the "fourth R" — reasoning — may lead to maladaptive behavior.

Between the two extremes of genetic and cultural determinants of retarded cognitive performance are numerous intermediate positions. A broad spectrum of organic causes are said to be implicated in the production of retarded performance. Whereas the genetic approach leaves no room for intervention, neurophysiological etiologies are sometimes open to modifiability, provided that intervention is initiated early enough. Similarly, the suggestion that poverty of stimulation during the early years of development may result in retarded performance also limits intervention to the earliest stages of development. What all of these approaches share in common, however, is the belief, either implicit or explicit, that retarded cognitive performance persisting beyond childhood is not a reversible condition.

THE CONCEPT OF COGNITIVE MODIFIABILITY

The defining characteristic of the approach represented by the Instrumental Enrichment program is the concept of "cognitive modifiability." The essential feature of this approach is that it is directed not merely at the remediation of specific behaviors and skills but at changes of a structural nature that alter the course and direction of cognitive development. To understand what is intended by the concept of cognitive modifiability, it is necessary to appreciate the difference between structural and other kinds of change that occur during the course of development. In the normal course of events, the developing organism undergoes a series of changes. On the one hand, changes of a maturational nature occur, such as the transition from crawling to walking. On the other hand, specific changes may occur as a result of exposure to a given set of circumstances, such as the learning of a particular arithmetic operation or a foreign language. *Structural changes,* however, refer not to isolated events but to the organism's manner of interacting with, that is, acting on and responding to, sources of information. Thus, a structural change, once set in motion, will determine the future course of an individual's development. When we use the term "cognitive modifiability," we refer to structural changes, or to changes in the state of the organism, brought about by a deliberate program of intervention that will facilitate the generation of continuous growth by rendering the organism receptive and sensitive to internal and external sources of stimulation.

In the section that follows, we provide an account of our approach to the problem of the etiology of retarded cognitive performance and the reasons for our insistence that, except in the most severe instances of genetic and organic impairment, the human organism is open to modifiability at all ages and stages of development. Evidence of the capacity for modifiability is beginning to mount, and the long held belief that adverse early experience produces permanent and irreversible damage is being seriously questioned. In fact, Clarke and Clarke (1976), in their presentation of little-known research and follow-up studies, incline toward the view that "the worse the early social history, the better the prognosis for change" (p. 72). The following case is presented as an illustration of how the products of adverse genetic, neurophysiological, and environmental conditions may be modified at a relatively late stage in an individual's development.

> Eleven years ago, M was referred to us for life-long placement in custodial care. At the time of his referral, he was 15 years old and his IQ, according to the reports, was in the 35–45 range. His vocabulary consisted of 40–50 words and he manifested severe impairment of spatio-temporal orientation, imitation, retention, and social behavior. Echolalia and echopraxia were observed, but no psychotic-autistic signs were detected. Trainability had been considered very poor, and custodial care seemed unavoidable.
>
> M was the second of three brothers. His father, a schizophrenic, alcoholic, and poorly adjusted Foreign Legion soldier, met and married M's mother in an Oriental country. The mother was retarded and illiterate, and died as a hospitalized, diagnosed psychotic. M suffered from brain damage caused by prematurity and low weight (2½ lbs.) at birth, and required prolonged incubator care. His infancy was marked by nutritional difficulties and by repeated and prolonged separations in nurseries and foster homes. His early adolescence was spent largely in socially and educationally restrictive environments.
>
> Contrary to all expectation, our assessment of M, using the Learning Potential Assessment Device (see Feuerstein, 1979), yielded a surprising level of modifiability. Accordingly, he was placed in a foster home group care treatment program for the redevelopment of severely disturbed, low functioning adolescents (Feuerstein and Krasilowsky, 1967).
>
> As a result of the intensive and concerted investment in M's development over the past 11 years, he has emerged as an independently functioning individual, oriented in space and time, with a full and rich command of spoken and written Hebrew, a sense of humor, social skills, and vocational ambitions. He is responsible for the maintenance of a large indoor swimming pool and has learned to speak French and some German. In spite of M's charged heredity, organic damage, maternal deprivation, and stimulus deprivation from his restricted early environments, all of which are considered responsible for retarded performance, he proved receptive to intervention, albeit of a sustained and systematic nature. The development of his capacity to use hierarchically higher levels of cognitive processes, such as representational, anticipatory, and inferential thinking, to a large extent determined his general behavioral adaptation. Thus, his entire destiny was changed from anticipated placement in life-long custodial care to the life of an autonomous, independent, adaptive young man, looking forward to building a future and starting a family.

The processes of redevelopment that so dramatically changed M's destiny are not nearly as rare as we have been led to believe and neither are they confined to isolated individuals. The research described in this book illustrates how the Instrumental Enrichment program may produce structural changes that transcend the acquisition of basic school skills in groups of adolescents. Thus, groups of children, many of them with organic and behavioral deficiencies necessitating placement in special classes, have been set on courses of redevelopment that have enabled them to expand their horizons and to not only be affected by life's experiences but to also actively contribute to the organization and planning of their own futures. The changes that these adolescents have undergone are reflected in the fact that the effects of the Instrumental Enrichment intervention tend to increase with time, after the completion of the program. Today, we find many of the individuals who participated in our research engaged in careers that were beyond any of the original expectations projected for the group. The factors responsible for such remarkable deviations from what is prematurely projected as the expected course of development are discussed in the next chapter, after the reader is introduced to the theory of mediated learning experience.

7

INSTRUMENTAL ENRICHMENT: DESCRIPTION OF INSTRUMENTS

The Feuerstein Instrumental Enrichment program consists of more than 500 pages of paper-and-pencil exercises, divided into 15 instruments. Each instrument focuses on a specific cognitive deficiency but addresses itself to the acquisition of many other prerequisites of learning as well. Fourteen of these instruments are regularly used in any classroom implementation of the program and provide sufficient material for a 1-hour lesson, 3 to 5 days weekly for, depending on the program, a period of 2 or 3 years. For prescriptive remedial purposes, the psychologist, counselor, and/or educator select those instruments whose emphases match the specific needs of the pupil under treatment.

In this chapter, only those instruments that comprise the regular course of study at this point in the development of the FIE program are presented. This introduction to the instruments is not intended as a handbook or a manual for teaching. Instead, it limits itself to a discussion of each instrument in terms of its objectives, its structure, and the means by which it attempts to reach its specific goals. Some exercises and typical anecdotes from the field reports received by the author and his colleagues have been included to illustrate points made elsewhere in this text. When the anecdote has been translated into English, an effort has been made to preserve the style and tone of the speaker with all the slang and agrammatisms of the original. In the rare cases when it was impossible to translate the statement literally, the spirit was preserved, although the level of language was not. A few of the instruments have been analyzed in terms of the cognitive map and objectives of the program to demonstrate how the teacher is asked to approach the instrument. Where anticipated errors have been shown, they are typical and have been copied from the work of FIE students.

The Instrumental Enrichment exercises can be divided into two broad categories: 1) those that are accessible to even the more or less totally or functionally illiterate individual, and 2) those that require a relatively proficient level of literacy and verbal comprehension.

We do not delay the use of Instrumental Enrichment materials with adolescents or young adults until they overcome their difficulties in the use of written materials. Even those parts that require certain levels of competency in reading can be used with illiterate adolescents because of the limited requirements of the material and the careful selection of words to be read and written.

The nonverbal instruments are *Organization of Dots, Analytic Perception,* and *Illustrations.*

The instruments that have a limited vocabulary and may therefore require teacher assistance in reading the directions include *Orientation in Space I, II, and III, Comparisons, Family Relations, Numerical Progressions,* and *Syllogisms.*

The instruments requiring independent reading and comprehension skills are *Categorization, Instructions, Temporal Relations, Transitive Relations,* and *Representational Stencil Design.*

Several other instruments, not included in the 2-year curriculum, but in various stages of development include *Absurdities, Analogies, Convergent and Divergent Thinking, Illusions, Language and Symbolic Comprehension, Maps,* and *Auditory and Haptic Discrimination.*

All of the instruments have been constructed along the Learning Potential Assessment Device (LPAD) model (see Feuerstein, 1979). Except for *Illustrations* and *Temporal Relations,* exercises in each instrument are graded in difficulty and complexity, with later learning based on mastery of the earlier tasks. The order in which the instruments are taught depends on both the needs of the class and the characteristics of the instrument, although for some of the instruments there is a definite teaching sequence. Thus, *Orientation in Space I* must precede *Orientation in Space III; Comparisons* is the prerequisite for *Categorizations, Transitive Relations,* and *Syllogisms;* and *Representational Stencil Design* follows work in *Organization of Dots, Analytic Perception, Orientation in Space, Temporal Relations, Comparisons,* and *Categorization.* Obviously, nonverbal instruments precede those that require a high level of competency in reading and writing when one is working with illiterate students.

Two different instruments are taught in alternate lessons to prevent the frustration that would commonly accompany the use of only one instrument in which either its modality or the deficient function it emphasizes would be unduly problematic for a student with specific deficiencies. If a student in a

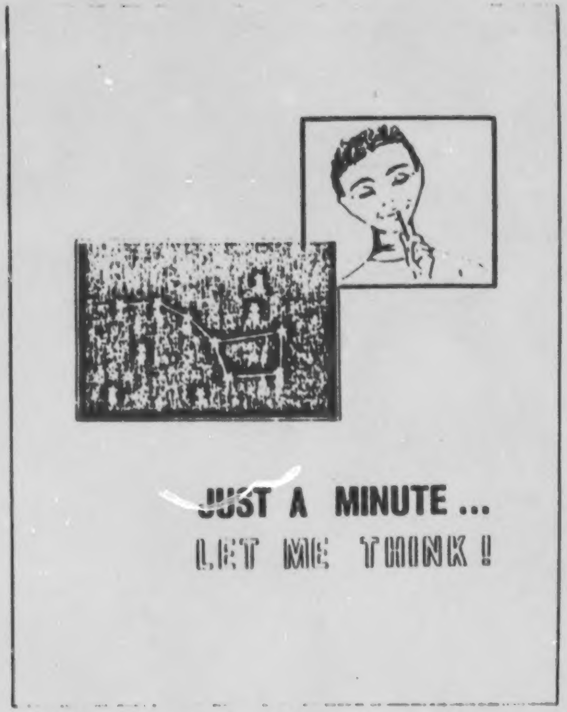

JUST A MINUTE ...
LET ME THINK!

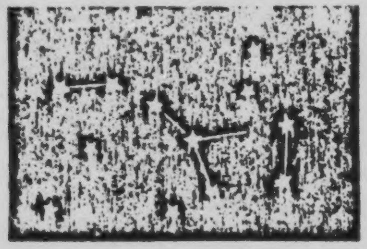
Figure 1. Each instrument has a cover page that bears the FIE identifying picture of a learner, the slogan of the program, and the symbol for the specific instrument it accompanies. The cover page is used to introduce the instrument and to arouse the interest and motivation, and in turn the need, of the students to cope with its exercises. The students must feel that the subject is not only interesting but relevant and important for them. The teacher orients the introductory discussion to include consideration of the symbol on the cover so that the student will start to gain insight into the meaning of the instrument for the attainment of the program's goals. (The cover page shown here is for *Organization of Dots.*)

class finds the material in a particular instrument relatively easy, he will still benefit from its instruction because of the reinforcement it provides. His success in the subject boosts his self-image and fosters his motivation. In prescriptive, individual work with a student, if the time at the teacher's disposal is limited, he will be able to concentrate on material that will correct the diagnosed deficiencies of the child in treatment.

Each instrument has a cover page (Figure 1) and is implicitly divided into units. Pages of exercises at the end of each unit can be used by the teacher to evaluate the student's mastery of the tasks. Each instrument also contains pages of mistakes in which the student learns to identify the source of errors. Usually when a culturally deprived child is confronted with an ertor in his own work, he tends to tear up the whole page or erase the entire problem rather than just the part in which the error occurs. Because the pages of errors are objective, they are nonthreatening to the child. Thus, the errors in either the instructions or the expression become a source of insight and further learning for the student.

The FIE program is taught along with the regular class curriculum by the classroom teacher, who has been especially trained in the material and the didactics of its presentation.

ORGANIZATION OF DOTS



The instrument, *Organization of Dots,* is based on a task produced by the late Professor André Rey of Geneva (Rey and Dupont, 1953). It was originally used as a selective device for persons who were to be oriented toward technical vocations and professions requiring specific spatial skills.

Molar and Molecular Aspects of *Organization of Dots*

The molar aspect of the task is to identify and outline, within an amorphous cloud of dots, a series of overlapping geometric figures, such as squares, triangles, diamonds, and stars (see Figure 2). The molecular components of the task are numerous and reflect a wealth of elements that can directly challenge the difficulties experienced by the retarded performer. The exercises therefore address themselves to the correction of a variety of deficient cognitive functions.

Projection of Virtual Relationships

The first component of the instrument involves organizing the dots and introducing into them a structure according to a given standard. To find the square and triangle, relationships have to be projected among otherwise discrete and separate existences, i.e., the individual dots.

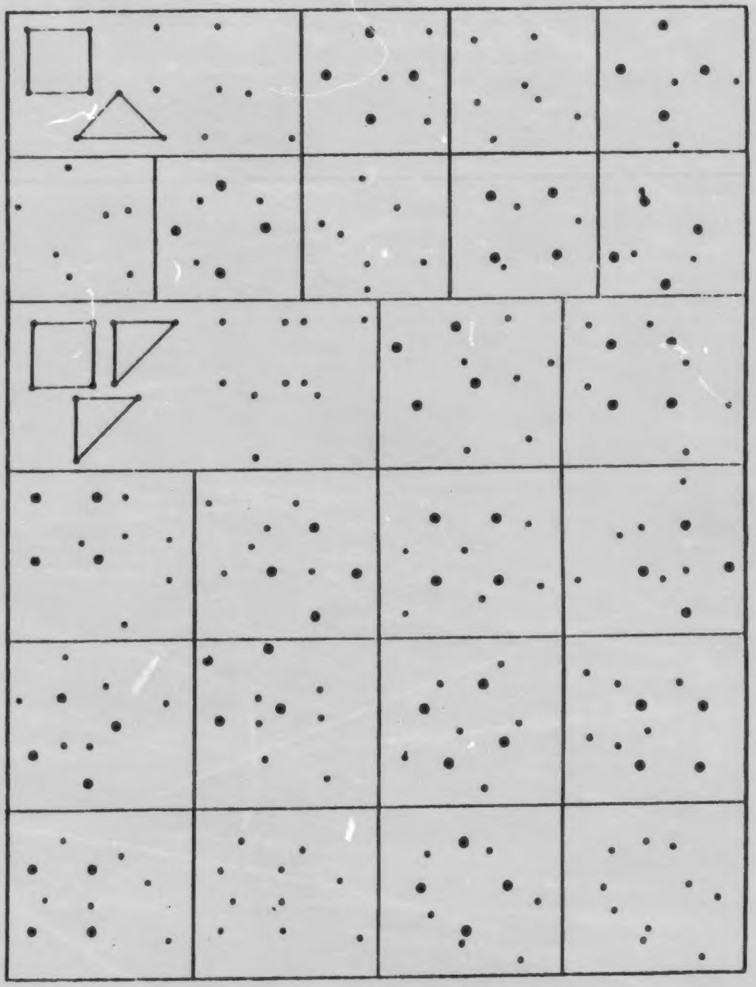
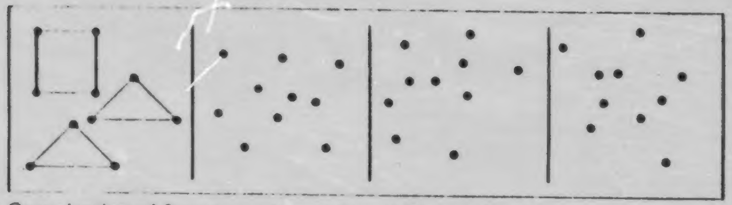


Figure 2. Page 1 from *Organization of Dots.* Completion of the task requires the projection of virtual relationships; discrimination of form and size; constancy of form and size across changes in orientation; use of relevant information; restraint of impulsivity; precision; planning; systematic search; and comparison to the model. The thickened dots aid in the projection of the square, but also serve as a distractor by preventing the perception of the similar arrangement of dots in pairs of frames in the bottom row on the page.



Organization of Dots (exercises 1, 2, and 3, page 2)

A square and two triangles, identical in size and form to those of the model, must be projected into each frame.

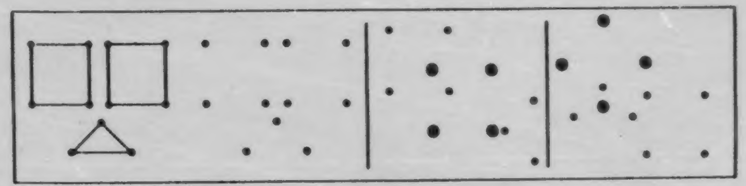
The performance of the culturally deprived children who were examined with these tasks did not substantiate the Gestaltist concept of the emergence of a structure as a result of isomorphic nature of our perception of the good form. Nothing was compelling, nor did the frames of dots "force" the retarded performer to perceive three dots as a triangle and four as a square, especially when to do so required a desegregation of various overlapping figures.

The projection of a virtual relationship does not occur in these children as a spontaneous response to the pressure of stimuli on the human organism, sensitized by a mental structure which is isomorphic to the good gestalt. Presented with opportunities to close the open part of a figure, such as a circle or a square, many culturally deprived children do not feel compelled to complete the good gestalt. That this is true, as well, with a fragmented gestalt is illustrated in work with some of the Raven Matrices. The child perceives the fragmented parts of the figures in an episodic way, with each part having its own autonomous existence, so that the parts from which he has to choose do not necessarily seem to him to be those that complete the gestalt. Work done by Rey and others on the filling in and closure of the gestalt has brought forth ample evidence that these are outcomes of learned behavior and, therefore, are not necessarily present following the development or emergence of structures through maturational processes (Feuerstein, Jeannet, and Richelle, 1953).

The projection of virtual relationships requires on the part of the individual an orientation or readiness to search for interconnections and meanings that do not necessarily stand out of the stimuli as vital attributes. The particular task, then, of Instrumental Enrichment is to produce in the learner a need to link episodically perceived events into a system by projecting into them relationships that are not necessarily obvious, and therefore not compelling. The projection of virtual relationships is a fundamental component of cognitive processes and leads toward higher mental operations.

Conservation of Constancy

After the projection of relationships, a second function of the instrument concerns the capacity to seek the constancy of perceived objects above and beyond variations in certain of their particular characteristics. In this case, the individual is required to identify the object's characteristics despite changes in its topological and orientational relationships. The difficulty inherent in this task is clearly observed when children, having already learned to identify the square when its base is parallel to the horizontal lines of the page, must identify the figure once it is oriented differently. Not only does the learner's established set make the task difficult for him to grasp, but the idea that the object can remain the same, continuing its constant existence above and beyond certain changes in its characteristics, must also be understood.

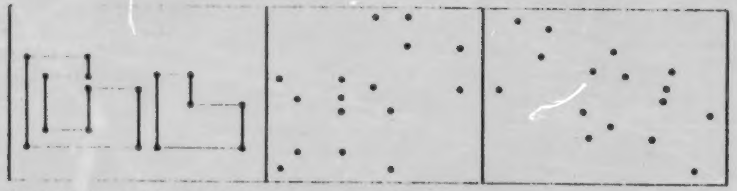


Organization of Dots (exercises 1, 2, and 3, page 3)

Constancy of the form of the square is conserved despite changes in its orientation.

Visual Transport

A third function is the visual transport of relationships, which requires a proper scanning process, focusing on the model figure and transporting its image visually to the field where it must be overlapped, compared, and judged as to the degree of its appropriateness to the given model. This requires a great deal of stability of the perceptual process and a variety of corrective devices to overcome the difficulties involved. Thus, many culturally deprived children do not conserve the model they have scrutinized and lose it en route to the place where they must find the figure again. In many cases, the perception of the figure is distorted by movements of the body; between the point of the gathering of the stimuli and the area into which they must be projected, something is either lost or altered. This has to do, to a large extent, with the vulnerability and fragility of the perceptual processes of these children.



Organization of Dots (exercises 1 and 2, page 11)

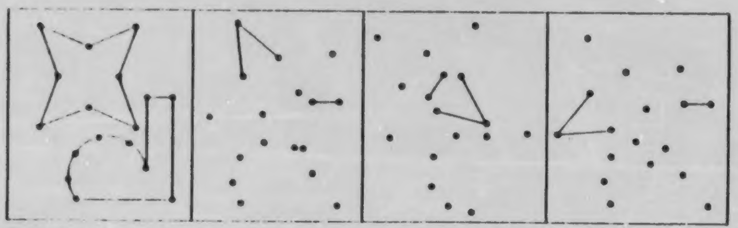
Asymmetry of the figures makes their interiorization and visual transport difficult.

Precision and Accuracy

A fourth function is concerned with the need for the individual to accurately identify dimensions such as size, distance, and parallelism of lines. Accuracy as a need is seldom found in the attitudinal repertoire of the culturally deprived child.

Summative Behavior

A fifth function, the need for summative behavior, is very limited in the culturally deprived child. To solve a given problem properly, before taking any action, the individual must define the structure by summing the number of dots required to form the standard figure.



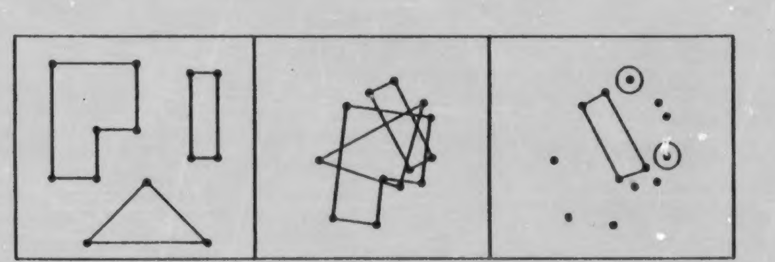
Organization of Dots (exercises 1, 2, and 3, page 9)

In the absence of angles, the number of dots in the curved line are of assistance in the drawing of the figure.

Three dots in a triangle do not differ from three dots in a square; the difference arises in that a triangle does not include the fourth dot necessary for the square. A child who begins with three dots in his search for the square may very well stop looking if he does not find the fourth dot immediately; or he may ignore the existence of the fourth dot entirely and close the three into a triangle because he has not appropriately summed up all of the existing stimuli in the perceived universe.

Planning and Restraint of Impulsivity

The sixth function, planning, and its correlate, the inhibition of impulsive acting-out behavior, are important requirements in fulfilling the exercises of *Organization of Dots.* Any unplanned move runs the risk of failure. Even if such a move succeeds in meeting the demands for one of the figures, subsequent work will reveal that the remaining dots are inappropriate for the other figures that must be projected. The responsiveness of the task itself provides the individual with an immediate feedback of the results of his unplanned behavior. Planning must encompass the entire activity, with all of its components.

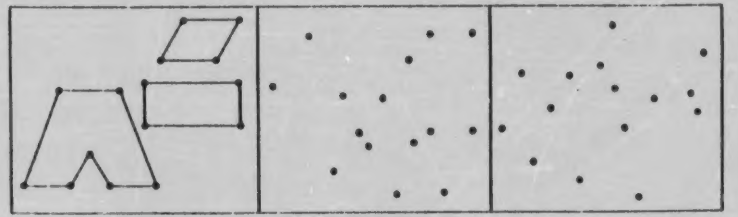


Organization of Dots (exercises 18, page 7)

Impulsive use of improper dots for the rectangle ultimately results in inappropriate dots remaining for the other two figures.

Discrimination

A seventh function can be described as the capacity to withstand and resist the seduction of an element that seems, at first, to respond closely to the established criteria. Two dots in close proximity, or two different sets of dots with the same characteristics of distance, angles, and so forth, need additional criteria to aid in their differentiation and use.



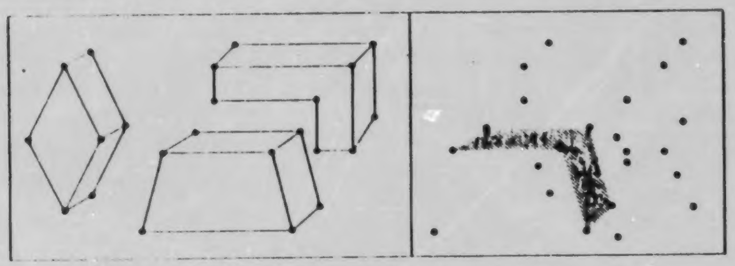
Organization of Dots (exercises 1 and 2, page 12)

If the distance between the two dots in the short sides of the rectangle is used as the sole criterion for search, an error is likely since that same distance is characteristic of many other pairs of dots in the model figure.

The temptation to use an inappropriate dot is here closely linked with impulsivity and the probabilistic use of stimuli. The capacity to resist such a temptation requires the development of a great need for accuracy and becomes progressively more essential as the complexities of the tasks presented to the learner increase.

Segregation of Proximate Elements

An eighth function is the need to segregate interwoven, overlapping elements that are very close to each other yet belong to different sets or groups of figures. This function has application in social as well as occupational areas. To be able to disentangle various components from a given complex social situation, one must be able to identify the patterns that characterize the different groups and relate the individuals to the specific pattern. This is not achieved without an orientation to searching for such relationships, where they are not immediately apparent, with the help of relevant cues, and then searching for supportive data to confirm the inferences.



Organization of Dots (exercise 6, page 20)

The complexity of the three-dimensional figures and the proximity between the dots create the need for segregation and differentiation.

Structure of *Organization of Dots*

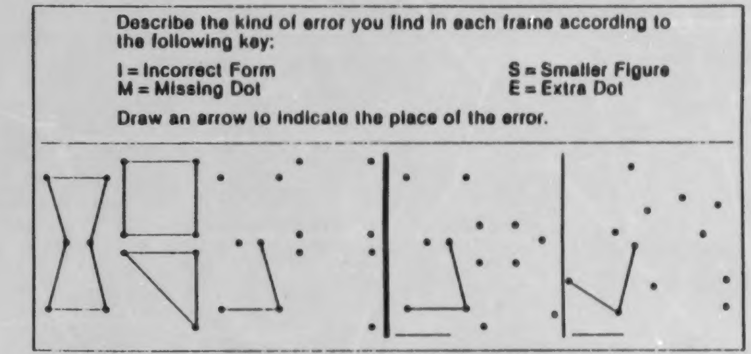
The 26 pages of *Organization of Dots*, each with between 14 and 18 exercises, provide the learner with ample opportunities for the activation of the various functions, for an understanding of the parts they play in the specific exercises, and for an awareness of their roles in the more molar behavior of the individual.

The instrument has been constructed so as to present each individual with a relatively high degree of difficulty, despite individual differences attributable to specific cognitive structures. Within the same exercises and level of complexity, through differentiation of the various spaces, the learner must discover geometric figures that become more intermingled and require progressively higher levels of discrimination, precision, and segregation. Even for the individual who has an easy grasp of such tasks, a great deal of mental power has to be invested in scanning, focusing, transporting, planning, and anticipating.

Errors as a Source of Critical Thinking

The instrument provides pages of exercises with intentional errors to provoke in the learner a conscious critical approach, associated with a verbal description of the source of errors in a given task. This experience permits the learner to anticipate the types of errors which may result if certain basic dimensions, such as size, angles, and orientation, are not considered.

The objective nature of the tasks makes the study of errors nonthreatening to the culturally deprived student. After sufficient practice in identifying the source of mistakes in these pages of errors, the student displays a readiness and an ability to apply the same critical approach to his own work.



Describe the kind of error you find in each frame according to the following key:

I = Incorrect Form
M = Missing Dot
S = Smaller Figure
E = Extra Dot

Draw an arrow to indicate the place of the error.

Find the Error—Organization of Dots (exercises 1 and 2, pages 5)

The student learns strategies for the critical examination of his own work through the identification of errors and their source.

The following anecdote, taken from a classroom discussion in a social studies class, illustrates how students can gain insight into using errors as a source of further learning.

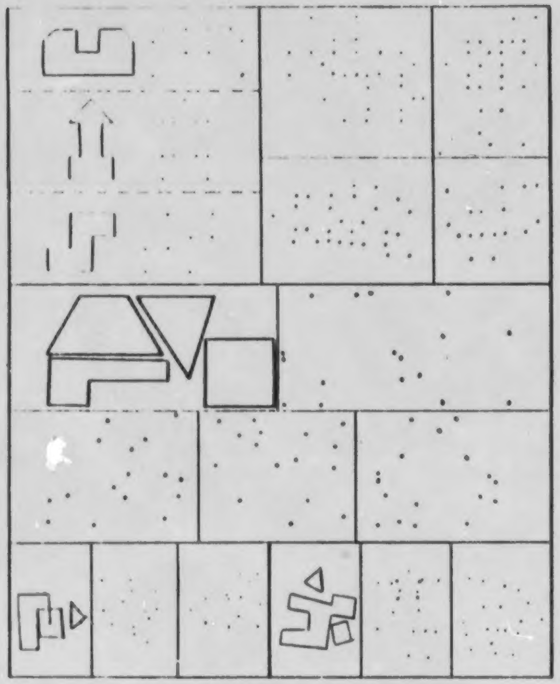


Figure 3. Children's productions.

> "In *Organization of Dots,* we are given a model. We have trouble in finding the figure and we do it wrong. What do we do? Do we tear up the page? Do we throw it away? Do we yell? Do we sit down and cry? No. . . . We see if it can be fixed. And, if it can be fixed, how can we fix it? Now let's look at our real-life situation. Is this the kind of government we want? Is this the kind of public we want? What happened? Something isn't right. Shall we cry? Shall we throw it all away? Or do we see where we made our mistakes? Is it possible to fix it? Just like in *Organization of Dots,* we saw whether the figure we drew was too big or too small, or crooked; here, too, we have to see. Slowly, in a systematic manner, we can find what isn't right. And we can correct it. And after we correct it we must keep the model of the kind of government we want firmly in mind, so that we don't make similar mistakes in the future."

Children's Productions

The activities in *Organization of Dots* are not limited to the discovery of relationships and their rediscovery in a variety of situations. The possibility of building such relationships and, on this basis, constructing a new universe of elements is offered as well (see Figure 3).

The opportunity to produce sets of instruments based on the discovered relationships is offered to the students as another way of enhancing their capacity to deal with the principles not only receptively but also actively and expressively. In many of our groups, adolescent learners have spontaneously produced pages with tasks involving the basic goals of our instruments. Their original productions demonstrate that they have been able to use many of the criteria employed in constructing the FIE instruments.

Additional evidence of the students' ability to internalize the goals of *Organization of Dots,* as well as those of other instruments, is their work as teachers' aides. In many classes, students who have completed their work assist the teacher with their peers who have been absent. These tutors have learned that to help a classmate does not mean to complete the task for him, and they are effective in the proper teaching of the material.

Classroom Implementation of *Organization of Dots*

Organization of Dots is the first instrument presented to students at the start of the FIE program. The reasons for the selection of this instrument are numerous. Because its tasks are very remote from those encountered in academic subjects, they are not accompanied by the negative affect associated with previous experiences of failure. Inasmuch as neither knowledge nor school-associated skills are required for engaging in the tasks, even illiterates are able to participate, without the onus that usually accompanies their schoolroom activities.

It is interesting to note that even children suffering from visual and motor deficits are able to work on *Organization of Dots.* For those with visual difficulties, a complete and precise verbal description of the form will aid in the interiorization of the standard and in the search for the figure. Inasmuch as the actual drawing of the line to connect the dots is neither the prime objective nor *raison d'être* of the task, it is sufficient to ask the student with motor difficulties to indicate where the line should be drawn; the line can be drawn for him. The advantages to be gained through this instrument warrant its use even under these difficult conditions.

The exercises are very different from those of the usual classroom curriculum for retarded performers in which primary grade material is introduced to adolescents without making the changes that age and life experience would seem to make necessary. The tasks are highly motivating and difficult. The fact that the teacher, although exposed to these tasks previously, must himself rediscover relationships well known to him if he is to correct and guide the child, creates the "equilateral triangle" of the teacher-material-student relationship (see page 282). Since the task requires an effort on the part of the teacher, as well as the learner, successful completion not only reinforces the student but also contributes to his readiness to accept and ascribe meaning to his mastery.

In providing evidence of the capacity of the students to master difficult tasks, to concentrate for long periods of time, and to work with task-intrinsic motivation, *Organization of Dots* is effective in changing the teacher's attitude toward retarded performers in general and toward those students who do not usually participate or are unable to perform adequately in subject-matter and vocational areas, in particular. The status of the retarded performer can also be raised with his normal peers by distributing some of the more difficult pages to those who feel themselves superior. It soon becomes evident that successful mastery requires a great deal of effort even from them.

In the hands of an experienced teacher, the instrument permits diagnosis of the student's deficient cognitive functions. It is possible, through *Organization of Dots*, to emphasize systematic work and restraint of impulsivity and to introduce all of the goals of the FIE program.

Analysis of *Organization of Dots* in Terms of the Cognitive Map

Content: Dots to be organized into geometric figures.

Modality: Figural.

Phase: Elaboration and output with the projection of virtual relationships; all three phases (input, elaboration, and output) with the utilization of almost all of the functions.

Operations: Organization of the field with articulation and segregation; differentiation and discrimination; categorization; anticipation and representation; inference; induction and generalization.

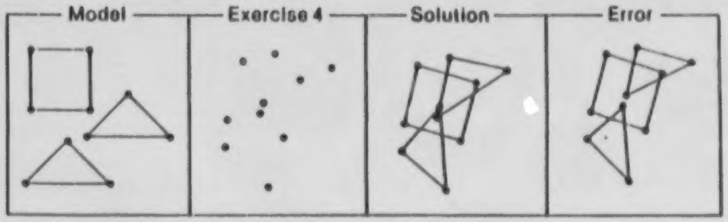
Level of abstraction: Low in actual solution of the problem; very high when principles and rules are generalized and applied.

Level of complexity: Low when model consists of familiar geometric figures and a relatively small number of dots; very high with the introduction of unfamiliar, asymmetrical figures, an increased number of dots very close together, and the necessity for fine discrimination and choice between dots that proximate those sought.

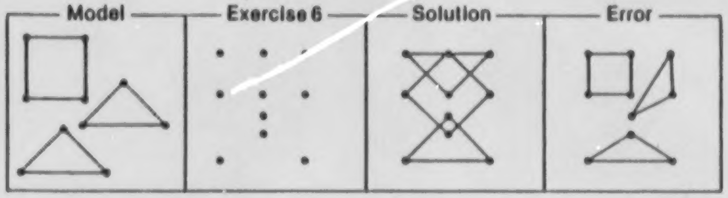
Level of efficiency: Shows effect of practice; decrease in number of errors and increase in speed of solution, with restraint of impulsivity and use of adequate strategies for search; reduced investment necessary for solving problems of increased complexity and difficulty, in terms of both time and subjective expression of affect.

Anticipated Difficulties

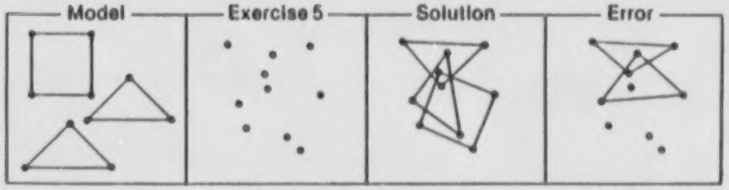
The teacher can anticipate the problems that will arise as the students are confronted with the demands of the tasks. An appreciation of the errors that are apt to occur guides the teacher in the presentation of the material. This can be illustrated by the types of errors that may occur, for example, on page 2 of *Organization of Dots*:



The difficulty stems from the necessity to discriminate between two dots that are very close together in order to assign the appropriate dot to the triangle to which it belongs. Errors may be caused by a lack of precision; impaired strategies for hypothesis testing; impulsivity with a probabilistic use of the first stimulus encountered; lack of comparison to the model after completion; and/or a deficiency in visual transport or interiorization of the model.



The difficulty stems from a tendency to use a gestalt or an inability to resist the temptation of using the first four dots that fit a pattern of a square. Errors may also be caused by the use of only one source of information, that of the figure, with no attention to size; impulsivity; a lack of interiorization of the model; a lack of comparison to the model; and a lack of self-criticism.



The difficulty stems from the necessity of defining a strategy for search. Errors may result from sweeping perception of the triangle; a lack of planning; impulsive behavior; inappropriate, uncritical use of a strategy; no exploration of alternatives; a lack of consideration of the sequence necessary for completion of the task; and a lack of comparison to the model.

In discussing errors of the type described above, and their sources, students' comments have included the following:

> "The person used trial and error. Like somebody who has to go someplace and tries different routes instead of asking somebody or looking at a map. He wastes time and effort."
>
> "The person forgot the correct figure. It's like somebody who can't remember exactly what he's looking for. He happens to find all kinds of things, some that he's been looking for before, in his search."
>
> "The guy wasn't exact. He was satisfied with something that was about right. That might be okay for some things but wait until the first time he has to walk a long way in shoes that are too small for him."

When asked by the teacher, "Where else is precision important to us?" students had the following responses:

> "In doing math, especially in a test."
>
> "When plans are drawn to build something. Then I have to follow them exactly or else things won't fit together right."
>
> "If a woman isn't exact in the amount of spices she puts in the food, it ain't fit to eat."
>
> "If I have to catch a bus that only runs twice a day. I'd better get there right on time because the bus don't wait for nobody."

Organization of Dots in Terms of the Subgoals of FIE

The attainment of the subgoals of the program can perhaps best be illustrated by presenting fragments of lessons, anecdotes, and reports from the field that indicate the spontaneous use by students of the functions, strategies, and principles acquired in *Organization of Dots.*

I. Correction of Deficient Cognitive Functions Aside from the previously discussed (pages 128–134) eight cognitive functions that may be identified in the presentation of this instrument, an attempt is made to involve all other functions that may have been identified. Within a very short time, the spontaneous behavior of students shows evidence of improvement in more than one function. The following case is illustrative.

> Less than 3 months after the start of FIE, to celebrate the holidays, each class in the school was asked to decorate its homeroom for a contest in which the best decorated classroom receives a prize. Therefore, the students were asked to work without any assistance from a teacher. A member of the school staff, in charge of the contest, reported that only the FIE students sketched plans, measured windows and walls, and categorized and summarized the materials needed. They assigned tasks to members and made a schedule of the order in which things should be done. The other classes proceeded impulsively without advance planning. There were quarrels, acrimony, and blame casting.

This report, echoed year after year in many schools in which FIE is taught, is evidence of students' spontaneous use of techniques of organization, planning, summation, categorization, and analysis, both of materials and the sequence of operations. Precision, the use of time and space dimensions, restraint of impulsivity, and reduction of egocentric behavior are also

indicated. There is an improvement both in problem-solving techniques and in social interactions. The replacement of competition by cooperation is illustrated by another passage from the same report:

> A student had placed a chair on a table in order to decorate. The chair teetered. A classmate called, "Wait! If you leave the chair that way, you'll fall. Let me fix it right and then I'll hold it for you."

In addition to hypothetical thinking and the ability to anticipate and represent the results of a cause-and-effect relationship, this interaction demonstrates an increased readiness to give and receive assistance from a peer.

II. Acquisition of Basic Concepts, Vocabulary, Labels, Operations, and Relationships The student learns to label not only the figures but also the operations and strategies he uses to construct them. Verbal mediators assist him in the interiorization of figures too complex to transport visually. Both vocabulary and strategies are transferred to other subject-matter areas.

> Overheard in a classroom: "Boy, he and I sure don't communicate."
>
> In a discussion of current events: "The lack of precision and common meaning in the United Nations Resolution 242 is what is responsible for all the disagreement." "Sadat has his own strategy."
>
> In geometry, the students immediately applied what they had learned about the square and the triangle. Math teachers reported that with the FIE students there was not the anticipated problem of differentiation between the square and the rectangle. "In computing the perimeter of a rectangle and a square, they know before any explanation that one must multiply the length of one side by 4 because there are four equal sides in a square, and that they must take twice the sum of the length and the width for a rectangle."

III. Production of Intrinsic Motivation Through Habit Formation The repetition of essentially the same task throughout the instrument creates a crystallization of the process of problem solution in *Organization of Dots.*

> "What do we do when we are given a page? We define the problem and see what we have been given. We look at the model carefully; we label it; if it is complex, we break it into manageable parts; we count the number of dots we need for each figure; we decide which figure we will look for and define its attributes so that they are points of reference; we plan our work; we select a starting point; we search systematically, using the strategy we have set for ourselves; in our search, we look for the attributes of the figure that are invariable and constant. We look for cues. We resist the temptation of an irrelevant dot; we use hypotheses and logic; we compare to the model if we think we have found the figure. If we make an error we examine it to discover the source of our mistake so that we do not make it again."

Teachers of other subject matter report hearing the FIE children start their work with: "Now what do we do when we are given a problem? We first have to find out what the problem is and then what is given. . . ." There is also spontaneous application of other automatized schemata. In a geometry class, FIE students were critical of the lines the teacher had drawn on the board to illustrate parallels, contending that, if the lines were extended far enough, they would ultimately intersect. They demonstrated an ability to project virtual relationships, a need for precision, hypothetical thinking, and a need for evidence.

In a physical education class test for kicking distance, pushing, shoving, quarreling, and cursing ensued as most of the boys tried to kick the one ball at the same time. An FIE student took charge and told the boys to get organized into a line in order to save time and ensure each boy his turn to kick, undisturbed. The student's behavior indicated a spontaneous definition of the problem, a framework for its solution, organization, and a strategy for efficiency.

IV. Production of Reflective, Insightful Processes Insight into the meaning of the activity is developed beyond the task of connecting the dots to form geometric figures according to a model. It is a realization of how the principles and strategies learned are generally applicable. For example:

> In response to the teacher's question of why the page should not be turned in the search for the figures, a student exclaimed, "What do you mean? If they give me a car engine to fix, I can't turn it around or turn it over just to suit me. I have to make the best of it and get along with it like I get it." Another student added, "But I will use my recollection of what the engine looks like when it's okay, and then I can see from that what is not right." And a third student said, "Until I can keep the model in my head I can use a plan of a motor to work with."
>
> A physical education coach, in a request for information on the FIE program, commented on the development of insightful processes:
>
>> In my physical education class there are three groups of boys, only one of which could be called "culturally deprived." The assignment for the day was volleyball and on the court on which the culturally deprived boys were playing the normal kids the game was slow in starting. I wandered over to see what was keeping them and heard a brisk discussion of the organization and strategy of the volleyball team. Who would stand next to the net and who would play in the last row, the strong players or the weak players? Was it better that all the best players start the game or would it be better to put them in after the opposing team started to tire? What would be the basis for deciding? Should the substitutions be arranged beforehand to prevent misunderstanding and allow the substitutes to be alert to the need for their entry into the game, etc.
>>
>> This discussion was surprising enough but the real shocker was that it was the culturally deprived kids who were doing the analyzing, thinking, and planning. I looked into it and found they were all FIE students. I thought you would like to know.

V. Creation of Task-Intrinsic Motivation Motivation is enhanced by tasks that are genuinely challenging and difficult. Although students are initially intrigued by the pages of *Organization of Dots*, they approach the lessons rather warily, still loath to participate in conversations or to volunteer information. Within the first 3 weeks, after successful completion of several pages of increasing complexity, they approach the teacher with requests for more pages. "If I could do that last page, I can do anything!"

> A principal reported that a young substitute teacher returned to his office in tears after her class had locked her out of the classroom. Some of the students met her in the hall prior to the lesson and asked her if she knew *Organization of Dots*. When it became obvious to them that she did not know what they were talking about, they refused to admit her. "Go tell the principal to send a substitute who knows Instrumental Enrichment."

VI. Change in the Attitude of the Retarded Performer from Perception of Himself as a Passive Recipient and Reproducer of Information to Perception of Himself as an Active Generator of New Information The student is an active partner in the exploration of strategies and the bridging from the principles learned in the exercises to other areas of his experience. As a consequence of work in *Organization of Dots*, the student's self-image is changed.

> A teacher reports that one of her students had no effective strategy for self-criticism and/or any recognition of the existence of errors in his work. Once he learned to compare to a given model, he brought a perfect page to the teacher, saying, "You know, I used to think I was really stupid. Now I know that isn't true at all."

A shift in the locus of control and a readiness to assume responsibility are evident. From three different reports:

> When students return to school after an absence, they themselves ask for the pages they have missed.
>
> They bring their own pencils and erasers to class.
>
> They have started to keep their folders organized according to subjects and page numbers.

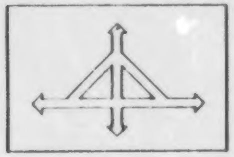
A communication received by the author from a teacher in a vocational school for dropouts and rejects from other schools is particularly salient testimony to the cognitive enrichment that can be achieved through FIE. The teacher had announced to the class that in the next meeting he would summarize what they had learned in *Organization of Dots*. At the beginning of the next session, a girl approached his desk and offered him a very neatly written piece of paper entitled "Summary of the Subject: *Organization of Dots*. What We Learned from the Subject." Listed were 16 items:

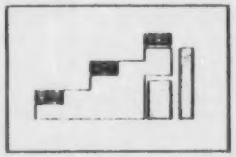
1. To take advantage of cues.
2. To organize according to a certain principle.
3. To define problems and recognize rules and characteristics.
4. To find the relationship between given data.
5. To take advantage of an error as a source of learning.
6. To start with and finish a problem you start with.
7. To use given lines for assistance.
8. To recognize figures, symmetrical and asymmetrical.
9. Self-criticism.
10. To plan a starting point.
11. To overcome difficulties.

12. To pay attention to several factors at the same time.
13. To find a strategy and its importance.
14. Order and its importance.
15. To pay attention to size and form.
16. The danger in using the dots that stand out in the pages.

Although some items on the list are repetitive, there is little doubt that the student saw *Organization of Dots* as a source of learning. As another child aptly put it, "It only goes to show you that you don't have to suffer to learn."

ORIENTATION IN SPACE I, II, AND III





Deficiencies in Spatial Orientation

Orientation in Space is composed of three instruments that aim at producing a direct attack on one of the most commonly observed deficiencies in the retarded performer: his limited use of articulated, differentiated, and representational spatial dimensions. This deficiency is most obvious when the orientation in space has to be detached from the learner's own action and must take on a point of reference outside of his own body.

Difficulties are twofold. The first has to do with the limited amount of representational, internalized behavior available to the individual, the corollary of which is his propensity to act motorically rather than to abbreviate the process in short-circuited form through representation. Thus, when an individual is required to indicate a point in space, his readiness and capacity to use representation may well be limited to those situations in which the possibility of using a motor modality is precluded. Such situations, however, occur infrequently in the life of the culturally deprived child, and his needs to orient himself in remote space are often limited. When he is called upon to act, he can easily master problems with motoric, gestural types of response. Therefore, representation and internalized behavior are not responsive to a real need for him. Such a need is only rarely aroused by a mediator who forces the child to use representation rather than motor behavior.

> "John, will you please tell Bob how to get to the nurse's office. . . . No, it's nice of you to offer but you don't have to take him. Just tell him."

A second difficulty has to do with the generalized lack of need to relate objects and events to the specific temporal and spatial dimensions that represent relational and sequential causal factors. According to various developmentalists (Piaget, 1956), the mastery of representational space is the result of a developmental process. Difficulties in temporal and spatial orientation, with certain more complex tasks, may occur in normal individuals even as late as 10 to 12 years of age.

Changing the Level of Representational Space

The necessity of producing a change in the level of representational space is twofold. First, there is the importance of such an orientation in the proper perception of objects and a great number of experiences. Second, the articulation of representational space can be used as an efficient carrier for the development of relational abstract thinking and the correction of a host of deficient cognitive functions. Relating two elements to each other, and coordinating one's view to that of another, with the basic comparative behavior involved in each of these processes, are only two of the many functions that can be activated in the acquisition of representational space.

Many classroom discipline problems stem from the inability to coordinate one's view with that of another:

> "Teacher, it wasn't my fault. I open the window 'cause I'm hot. He close it 'cause he's cold. I tell him to put on a sweater and then I open it again. He punches me in the stomach and I hit him in the mouth."

The perception and understanding of transformations as deriving from certain operations can also be acquired through representational space perception.

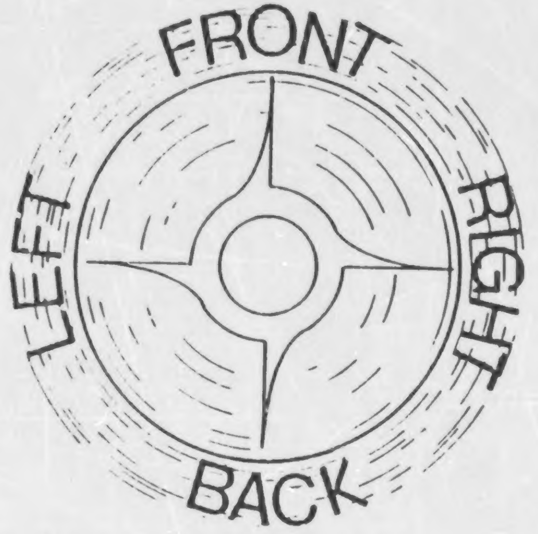
Description of *Orientation in Space* Instruments

The first of the three instruments deals with spatial orientation relative to one's own body in which the frame of reference is one's own movements; the second adds dimensions of topological space with *on, above, below, up, down,* and *between;* and the third deals with an external stable system of reference, that of the cardinal points of the compass, which then combines with the first two systems of reference.

These three instruments are directed primarily toward the creation of specific strategies for the differentiation of the spatial frame of reference from other criteria and toward the introduction and demonstration of the relativity of certain systems as contrasted with the stability of others.

Plasticity of Orientation

At the beginning of *Orientation in Space I,* a turning pinwheel is the symbol of a system that relates to one's movement. It illustrates the concepts of *front/back* and *left/right* as being relative and dependent upon the relationship between two or more objects. "What" is located "where" is a function of movement. Following a certain movement, what was previously "right" will become "left" or "in front" will become "in back." This concept is fairly difficult for some retarded performers who will insist, "When I turn, my right hand will be my left hand." This response is not due to an inability to express verbally the product of a correct elaboration, but stems from the lack of perception and understanding of the nature of the transformation.



Orientation in Space I (page 1)

The movement illustrates the relative nature of the relationship between two objects. However, the internal relationship of the four directions, one to the other, is stable.

The need to produce flexibility and plasticity in the individual's orientation goes beyond the specific area of space and is, to a large extent, similar to the need to decentrate the individual so that his views are no longer egocentric. The individual is then able to consider hypothetically and representationally another's point of view, which may differ from his own.

> The teacher started a discussion by asking, "Why is it important to know what others think? Why isn't it enough just to know how I think about something?"
>
> Student: "My sister found a purse with 100 dollars in it. She took it to the police station and they found the owner."
>
> Teacher: "Was that smart? Just think of the number of things she could have bought if she had kept the money!"
>
> Student: "Yes, but she could only think of how terrible the person who lost the money felt."

Once a comparison between the two perceived points of view has been made, they can be judged more objectively. Relative positions can then be decided on the basis of data derived from two or more sources of information, with proper weight attributed to each. Rendering the perception of space flexible is to be seen not necessarily as a content-oriented need, although it fulfills an important one, but rather as the need to create a capacity and readiness within the individual to act on the world in a representational, internalized way, since this is the basis for abstract mental operations.

Distance as a Factor in Interactions

One may use the concept of distance in describing the interaction between the organism and the world. The sensorimotor interaction represents the smallest interactional distance, while the representational and abstract modalities represent the widest and the most distant ones, which permit both a range of activities in time and space and a high degree of reversibility and flexibility (i.e., equilibration).

Moving around in history and contemplating the future demand the use of representational and abstract thinking for hypothesizing and predicting possible outcomes of certain events. This kind of interaction between an individual and the world has a meaning that is more remote and of broader range than that entailed in the concrete and sensorial dimensions of the experienced world. Thus, representational, internalized activities may enhance the repertoire of the individual and his capacity to act on more remote space.

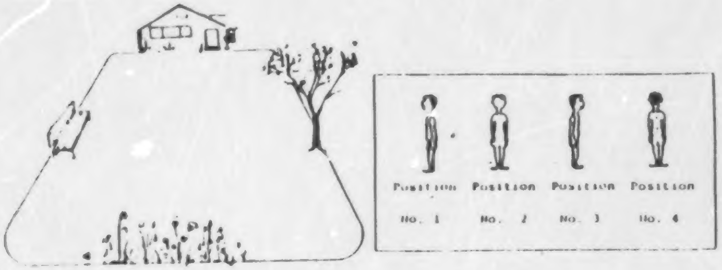
Description of *Orientation in Space I*

Orientation in Space I, 16 pages in length, deals mainly with the concepts of right/left and front/back. In a sequence of tasks these relationships become more and more devoid of figural support and consequently more and more remote from the body's own movements. Even when figural elements are used to represent changes produced by movement, it is always the representation of a relationship toward which one strives and that is required from the learner. The need to render the required flexibility into a stable and easily elicited function is ensured by the repeated exposure to the same task. The generalizability of this representational approach is attained by varying the nature of the tasks while keeping the principles and concepts that are involved constant.

> In a history class: "It's just like in politics. If you take the Liberal party as your starting point, you turn right to get to the Conservative party and turn left to get to the Socialist party."
>
> "We learned the story of Saul and Samuel in the Bible lesson. I think I can understand why Saul felt that he had to give booty to his soldiers, but I can also understand why Samuel was so angry. You can't just say who was right and who was wrong."
>
> "Also Samuel was angry because Saul didn't wait for him. It's like the time I waited and waited for my boyfriend, and he didn't come, so I left without him.

> Boy, was he mad! But how long is a person supposed to wait for somebody else?"
>
> In discussing the importance of orientation: "The sign + cannot be turned on its side without changing its meaning. It would become an × and then we'd have to multiply instead of adding."

The tasks of the first part of the instrument deal with the relationship between objects and a human figure. The four objects, a house, a tree, flowers, and a bench, are fixed in a stable position on the field, whereas the human figure changes in its orientation. He is depicted so that one sees him from the front, from the back, from the left, and from the right. The relationship between each of the objects and the human is relative and contingent upon the latter's changing position. The shifts in the position of the human are encoded with numbers and then become referents for the establishment of new relationships.



Orientation in Space I

The position of the figure and the objects in the field must be coordinated in tasks on pages 6, 7, 8, and 9 in order to arrive at the relationship between them.

The student is asked to represent the relationships between the object and the human from a variety of points of reference: Once he is asked to describe the relationship between the position and the object in terms of direction; once he is asked to describe which of the positions is appropriate so that the relationship between it and an object will yield a given direction; once he is asked which of the objects is required in order to qualify for a given direction in relation to the human. In a page that summarizes the unit and can be used to evaluate mastery, a mixture of tasks similar to those on preceding pages is provided (see Figure 4, *left*).

> A student commented, "This is like a question in math. Once they ask you 2 + 3 = ?; once 3 + ? = 5 and once ? + 2 = 5. But if you have any two of the numbers in the problem you don't have any trouble in finding what the third will be."
>
> The teacher asked for a discussion of the problem in which relationships are sought, but no information is given and all the spaces are blank: "I can start

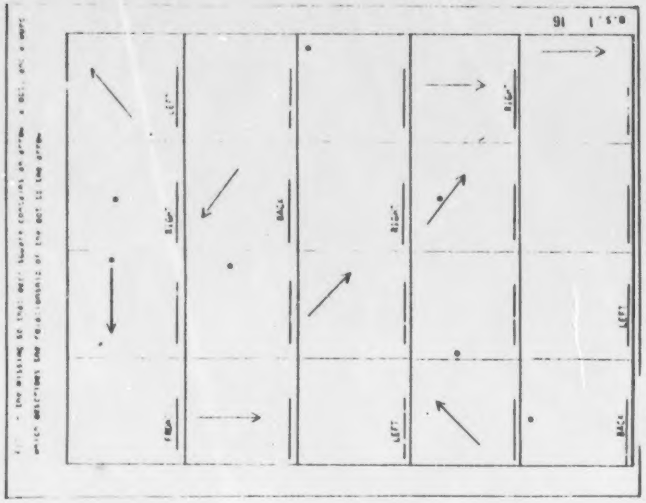
> with anything I want. I hate questions like these. It's like when I am supposed to write a composition about any subject I want. I never know what to write about."
>
> "No, it's not. It just *seems* like you can do anything you want. But once you choose one thing, you're already limited, and then when you choose the second thing to go with it, you're stuck. There is only one possible answer. It's just like teacher saying, 'When you finish your work, you may do what you like.' What I'd like to do is go home, but I can't do that. I can do anything I want as long as I stay in class, don't talk, don't make noise, and don't bother nobody who's still working."

The second half of the instrument introduces arrows and dots, with the dot in place of the object and the arrowhead symbolically representing the face of the human. The symbols force a detachment from one's own body movement, which has served as the basis for the initial discrimination and division of the world into the dimensions of left/right or front/back. The axis of the body, permitting the distinction, serves as the basis, but it no longer serves as the sole criterion. The level of abstraction becomes higher as the tasks move from a depiction of concrete objects. Tasks are again varied and culminate in a page that blends exercises similar to those on preceding pages (see Figure 4, *right*). In the report below, a teacher takes up a discussion of symbols, facilitated by the later exercises of *Orientation in Space I:*

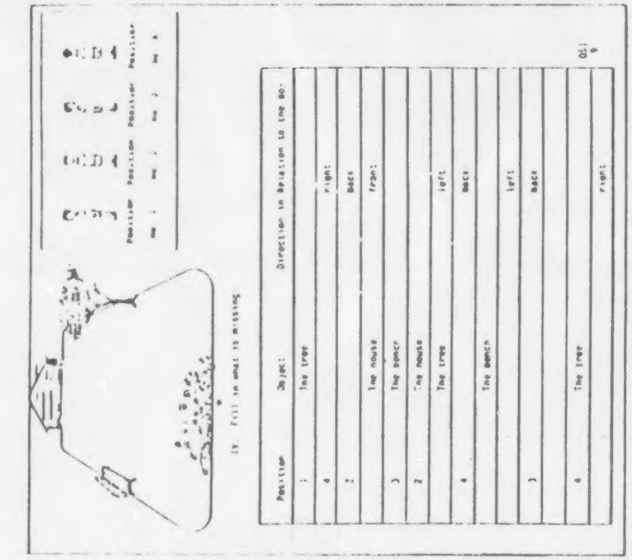
> Teacher: "The arrow serves as a symbol for a boy standing in a certain position. What other symbols do you recognize from other subjects?"
>
> "In algebra, a + b = b + a. The letter a serves as a symbol for any number. We can put any number in the place of a and b. + means add, and = means same as."
>
> "In music, there is a symbol that tells you the key and the notes are symbols of sounds."
>
> "Temperatures are symbols. For instance, 0 stands for a certain amount of cold."
>
> "This is not in a subject, but there is a symbol for the telephone company in the shape of a bell. Many organizations and governmental branches also have symbols."

(In the above example, the teacher could perhaps have differentiated between symbols and signs.)

For some retarded performers, this work on representation of space is, in many cases, the first time the student experiences a detachment of his self from the concrete, motoric modality of operation in the world. An approach that requires representation is seldom, if ever, requested from the retarded performer in other intervention programs. The use of this operation is significant as an initial attempt to provide the child with such an experience. From this, he may accede to more complex and higher levels of representation and operation.



Orientation in Space I (page 16)

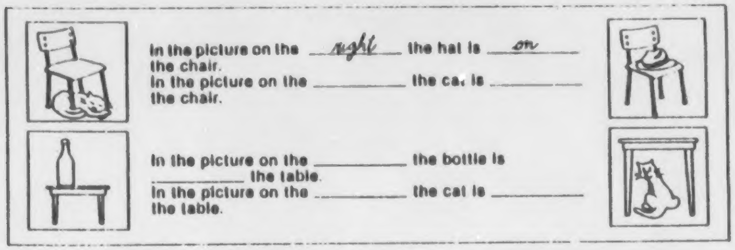


Orientation in Space I (page 9)

Figure 4. (Legend on opposite page.)

Description of *Orientation in Space II*

Orientation in Space II numbers only seven pages. To the elements of *Orientation in Space I*, it adds the parameters of *up, down, between, above, below, beneath,* and *beside* to describe the orientation of an object in space.



In the picture on the right the hat is on the chair.
In the picture on the ______ the cat is ______ the chair.

In the picture on the ______ the bottle is ______ the table.
In the picture on the ______ the cat is ______ the table.

Orientation in Space II (exercise 1, page 2)

The task requires the use of recently acquired concepts to describe the relative location of the object.

In addition to reinforcing the system of reference acquired in the first instrument, the exercises also elicit the need to view the same object or event from differing points of entry. For example, if a book is on the table, the table is under the book. The retarded performer is required to be an active participant in the construction of material by composing sentences that describe the same event from the viewpoint of the two or more referents in the interaction.

Orientation in Space II is included in FIE at the discretion of the teacher to meet specific needs and deficiencies of a student or a class.

Description of *Orientation in Space III*

Orientation in Space III, 29 pages in length, introduces an independent external frame of reference. In the exercises in the first unit, the four cardinal directions of the compass are presented as a stable system for describing the

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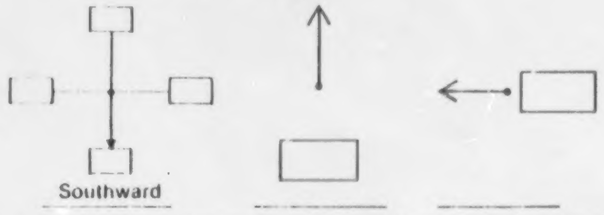
Figure 4. *Orientation in Space I.* To enhance the ability to use concepts and stable systems of reference for orientation in space — concrete, abstract, and interpersonal. Distinction is made between relationships that are relative and can be described from a multiplicity of angles and those that are stable and can be fixed by coordinates. Precise and accurate communication of information lessens egocentricity. *Left:* This page summarizes preceding exercises and illustrates varied repetition of a principle to facilitate habit formation. Solution requires: definition of the problem; visual transport or internalization; simultaneous use of several sources of information; systematic work; and hypothetical and inferential thought as a basis for logical conclusions. The student learns of delimitation of alternatives and how to summarize his data, using a table. *Right:* Solution involves: redefinition of the problem with each frame; the use of symbols, encoding and decoding; the conservation of the constancy of the relationship across variations in the orientation of the arrow; projection of virtual relationships; hypothetical thought; and precision in gathering and communicating information.

position of an object in space. The orientation of an object can be perceived directly or inferred from the knowledge of the internal relationship between north, south, east, and west and their positions relative to one another.

COMPASS DIRECTIONS DO NOT CHANGE

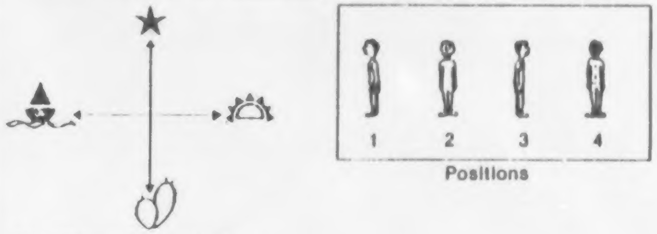
A. Write the directions inside the rectangles.
B. On the line below each diagram write the direction in which the arrow is facing.



Orientation in Space III (exercises 1, 13, and 14, page 3)

The exercises require the coordination of information and inference in order to fill in the direction to which the arrow is pointing and the direction of the rectangle in relation to the arrowhead.

In the second unit, the stable system of reference of north, south, east, and west is coordinated with the relative system introduced in *Orientation in Space I.* The two systems are integrated in a way that permits their simultaneous use for the shifts in orientation that occur with movement. The relationship between the sides of the boy and the fixed compass directions are taught thoroughly, with a variety of possibilities for grasping the differentiated nature of the two systems and their points of congruence.



IV. Fill in what is missing:

	POSITION	DIRECTION	SIDE
(1)	4	East	
(2)	1		Right
(3)		South	Front

Orientation in Space III (Task IV, exercises 1, 2, and 3, page 7)

The human figure, in four positions, and the field with its compass points were coordinated in the preceding three pages, in each of which the referents and the given information differed.

In the task at the bottom of page 152, exercise 1 represents tasks in I in which the direction and position are given, and exercise 2 exemplifies II in which position and side are given, while exercise 3 gives an example of tasks in III in which the side and directions are given. IV involves a definition of the problem and may be used to indicate mastery.

In the third unit, the tasks are geared toward the establishment and reinforcement of internalized relationships in space, a grasp of these relationships, and an understanding of the operational nature of manipulating them. Represented movement, involving the number of turns or revolutions necessary to reach one direction from another, is taught as a function of the fixed interrelationship between compass points. Divergent thinking is encouraged in tasks eliciting alternative possibilities of reaching an objective.

F. Use "north," "east," or "west" to fill in what is missing:
You are looking at the North Star.

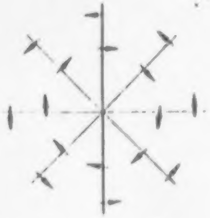
In order to face ________ turn once to the right.

In order to face ________ turn twice to the left.

In order to face ________ turn once to the left.

Orientation in Space III (exercise F, page 8)

The need to use two or more sources of information to solve problems is specifically dealt with in the fourth unit through exercises in which two coordinates are the basis for trajectories. The system of reference is expanded to include the secondary compass points and is applied in exercises of increasing complexity. The student learns that representation of movements can be eliminated, altered, or undone by doing the reverse, directly or indirectly.

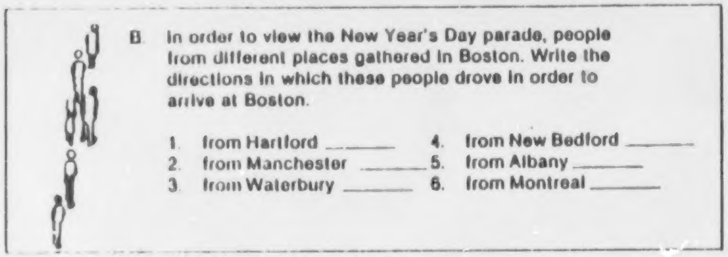


F. You are facing southwest.
Make 3 turns right, 2 turns left, and 5 turns right.
Where will you arrive? ________________

☐ - ☐ + ☐ = ☐ Equal to ______

Orientation in Space III (exercise F, page 18)

In the last unit, both stable and relativistic frames of reference are applied in a series of exercises in which the student is given a starting point and a goal and asked to describe an itinerary. These exercises have as their major orientation and objective the constant use of internalized, representational movements, including numerical elements, as the determinants of the outcome. There are ample opportunities for crystallization of habits and attitudes for the proper grasp of the internal and external worlds.



B. In order to view the New Year's Day parade, people from different places gathered in Boston. Write the directions in which these people drove in order to arrive at Boston.

1. from Hartford ______
2. from Manchester ______
3. from Waterbury ______
4. from New Bedford ______
5. from Albany ______
6. from Montreal ______

Orientation in Space III (exercise B, page 24)

A map is provided in the instrument so that solution is not contingent upon prior knowledge. The changing description of the relationship between Boston, whose position is fixed, and the other cities is a function of the location of the city of origin with reference to Boston.

Meaning of the Instruments

The meaning of these instruments beyond their general goal is clear: their content, as such, is a condition of efficient problem-solving activity in a variety of day-to-day and more specialized tasks that involve both the receiving of instructions concerning sources of information and the carrying out of those instructions. Lack of orientation toward the dimensions of space, associated with limited or even nonexistent representation in their use, will, of necessity, bring about failure at both the input and output levels of the mental act. Even in such controlled situations as the classroom, the teacher's instruction, "Look at the figure in the upper left of page 2," will not orient the individual to the required place, and his focusing will be diffuse. If there is not discovery through extrapolation from other details provided by the teacher and accidentally grasped by the student, the individual may fail totally; or, at the output phase, he will incorrectly indicate what he may have correctly perceived. This is even more true when subject matter, like geography, in which orientation in space is crucial, is involved. In vocational subjects, in which coded directions must be understood, the incapacity or the lack of orientation to register and interpret symbols and codes properly leaves the individual with trial-and-error behavior. Trial and error, even when it leads to successful operation, will remain task bound, inefficient, and of limited adaptive value.

Need for Flexibility

The need for flexibility is especially clear in occupations requiring behaviors of a rather sophisticated level, which demand a high degree of representation, a strong automatization of the spatial concepts, and the cognitive flexibility to overcome the sets that have been established through experience. Many adults have to readjust to situations that are presented to them in a way that is unfamiliar or, in some instances, incompatible with their previous experience. This can be exemplified by trying to remove a screw from the underside of a stove.

The mirroring phenomenon shows that for many initiated adults constant alertness and vigilance are required to overcome orientational difficulties inherent in unfamiliar or set-opposed situations. A most common example is attempting to fix a stray lock of hair while looking in the mirror. In driving, calisthenic drill, gymnastics, and other tasks requiring coordination and reversal of stimuli in order to function properly, representational, flexible, spatial orientation is of highest importance.

Analysis of *Orientation in Space* in Terms of the Cognitive Map

Content: Systems of reference that permit the localization of objects in space and in relation to one another.

Modality: Mainly figural and graphic, with limited verbal elements; symbolic coding system; maps.

Orientation in Space I has only eight words, which are repeated throughout; it can therefore be used with illiterates.

Orientation in Space II and *III* have limited vocabularies but require a certain level of mastery of the reading process. Not withstanding a low level of lexical function, students can master key words with the help of the teacher.

Phase: *Input:* The provision of basic concepts relating the individual to his surrounding space.

Elaboration: The acquisition or induction of basic functions, such as comparative behavior and planning behavior, internalized as prerequisites for proper mental functioning and enhanced by this particular activity; the constant confrontation with two or more sources of information as the condition *sine qua non* for the proper solution of a presented problem.

Output: The detachment of the individual from a system of reference limited to his own body, thereby leading to a process of decentration, which results in a higher level of flexibility, an openness toward different views, and a reduction of egocentricity.

Operations: Enhancement of a greater reliance on the representational modalities of action by use of a variety of situations, beginning with figural elements and ending with symbolic coding systems in which the identification process or the capacity of the individual to be helped by the movement of his own body is progressively reduced; the coordination and integration of two or more systems of reference through the confrontation between one that is stable and relative and another that is unstable but constant; production of relationships through coordination and deduction in a variety of modalities in which to operate with these concepts.

Level of abstraction: Relatively low in exercises having figural elements; moderately high with symbolic encoding; high with representation devoid of figural support.

Level of complexity: Low to moderate.

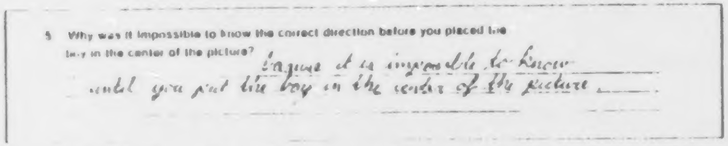
Level of efficiency: Moderately high with use of figures; slight, barely discernible body movements of students give evidence of motor behavior as aid; with decentration and use of symbols and codes, level of efficiency drops until practice shows results.

Anticipated Difficulties

The retarded performer's propensity to act motorically may be complicated if, in his indication of right and left, he centers his attention on his hand as an external instrument that can transcend the median axis of his body or its interior and intrinsic order. In such a case, if the individual is asked to point to the left part of an object, he may designate the part in accordance with the hand with which he points. Left, then, is where he places his left hand. He passes through the border of the axis of his body and manifests instability in the use of the only frame of reference that permits the division of the world into left and right.

Verbal labels may present a problem both in the input and output phases. If the child uses the word "relation" or "relative," it is usually to indicate a member of his family. "Side" and "direction" may become confused when the same word (e.g., "right" or "left") is used to indicate both.

An inability to answer logically is exemplified by the tautological response in the example below:



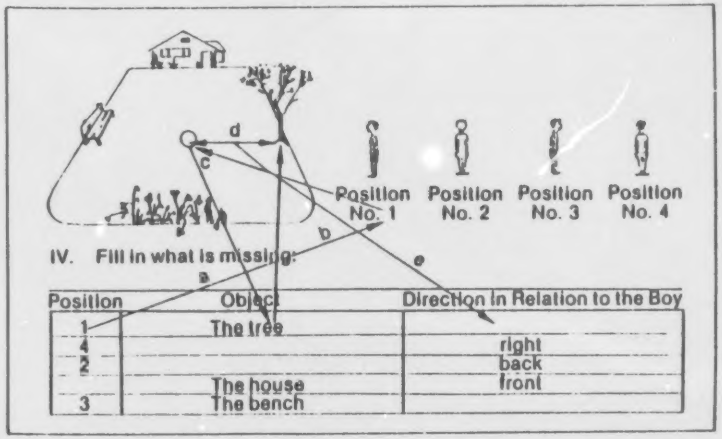
5 Why was it impossible to know the correct direction before you placed the boy in the center of the picture?

because it is impossible to know until you put the boy in the center of the picture

Orientation in Space I (exercise 5, page 5)

In the example on the next page there can be several sources of difficulty. The child must define the problem, which shifts from line to line (a). He must use several sources of information. He must identify the boy he seeks from a given code (b); transport him visually into the center of the field (c); identify the relationship between him and a given object (d); and then

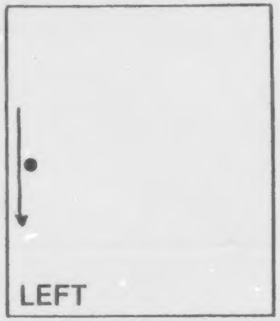
produce the answer in terms of object, relationship, or position using the code in the appropriate space (e). With a narrow mental field, an inability to define the problem, difficulty in eliminating the noise of extraneous and irrelevant stimuli, or an inability to coordinate several sources of information, he is unable to succeed in the task.



IV. Fill in what is missing:

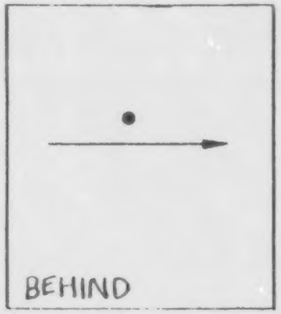
Position	Object	Direction In Relation to the Boy
1	The tree	
4		right
2		back
	The house	front
3	The bench	

Rigidity of response can be demonstrated by the following example. A child may go to great lengths in order to squeeze an arrow between the dot and the side of the frame, despite unlimited possibilities of fulfilling the request in other ways. The lack of flexibility and plasticity is readily apparent. Another type of error in the same exercise is indicative of the apparent use of self as the referent.



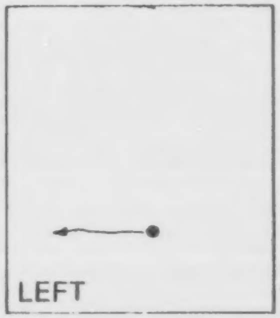
Orientation in Space I (exercise 10, page 15)

In the exercise on page 157, the task is to draw an arrow so that the dot appears on its left. The inability to see alternatives, impulsivity, insufficient reflection, and a lack of flexibility may account for the product.



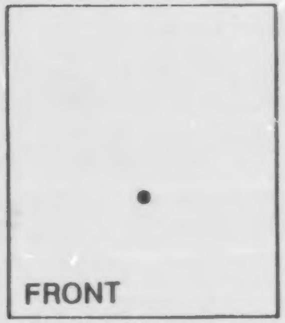
Typical error—*Orientation in Space I* (exercise 10, page 13)

The task is to describe the position of the dot in relation to the arrow. This error stems from an incorrect definition of the problem and decoding the written instruction into an action, so that the arrow is described in its relation to the dot.



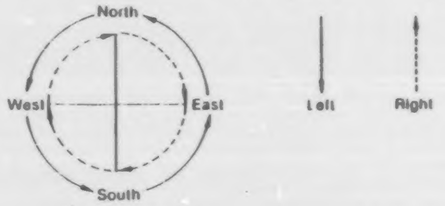
Typical error—*Orientation in Space I* (exercise 18, page 16)

The task is to draw an arrow and a dot so that the dot occupies the given position in relation to the arrow. This type of error indicates the use of self as the referent and the inability to divorce spatial representation from one's own body.



Orientation in Space I (exercise 4, page 15)

In one class the children excitedly revealed that they could draw arrows all around the dot and still comply with the instructions to draw an arrow so that the dot would appear in front of it. "We could draw 360 of them to correspond with the number of degrees in a circle," said one student. Another added, "And if we had a bigger circle, we would have more degrees and more arrows." The teacher agreed.



1 turn = ¼ circle
2 turns = ½ circle
3 turns = __circle
__turns = full circle

3. You are facing north.
A. Make 4 turns to the right and 1 to the left. Where did you end up? ______ East ______.
B. Make a full circle to the right and ¼ circle to the left. Where are you now? ______ East ______.
One turn = _____ circle. _____ turns = ¾ circle.

Typical error—*Orientation in Space III* (exercise 3, page 10)

The error above may arise from the inability to derive the appropriate information from the key: that one must stand in the center of the circle. Both hypothetical thought and representation are necessary. An error may also be caused by the lack of understanding of the principle of the nullification of a movement by its reversal. An additional difficulty stems from the necessity of translating from code to code, from turn to circle, and finding equivalents.

Inappropriate Use of Stable System of Spatial Reference

Teachers, too, may sometimes use inappropriate systems of spatial reference. For example, a teacher asked the students to write their names on the northeast corner of the paper, by which she meant its upper-right corner. This, obviously, is an inappropriate use of the cardinal points as a system of reference. This error is often made by children who are taught that north is at the top of their heads so that they automatically label the top of anything as its north.

The *Orientation in Space* Instruments in Terms of the Subgoals of FIE

I. Correction of Deficient Cognitive Functions In the following anecdote there is evidence of the effect of *Orientation in Space* on the correction of deficient cognitive functioning:

> In discussing an accident in which a girl had been hit by a car in front of the school but had run away from the scene as soon as she was able to stand: "How could she have crossed the street without looking to her left and to her right?" "She shouldn't have run away." "She should have realized how concerned the driver of the car would be." "She should have stayed and found out how it happened and who was to blame." "She didn't think. She just got scared and ran. It's always a good idea after an accident to be checked by a doctor to be sure that everything is all right and to get the name of the driver in case there is trouble afterwards."

This discussion evidences use of the concepts of spatial orientation; criticism of impulsivity; empathy; analysis of cause and effect; hypothetical thinking; search for cause of an error so as to prevent its happening again; generalization; and need for the acceptance of responsibility.

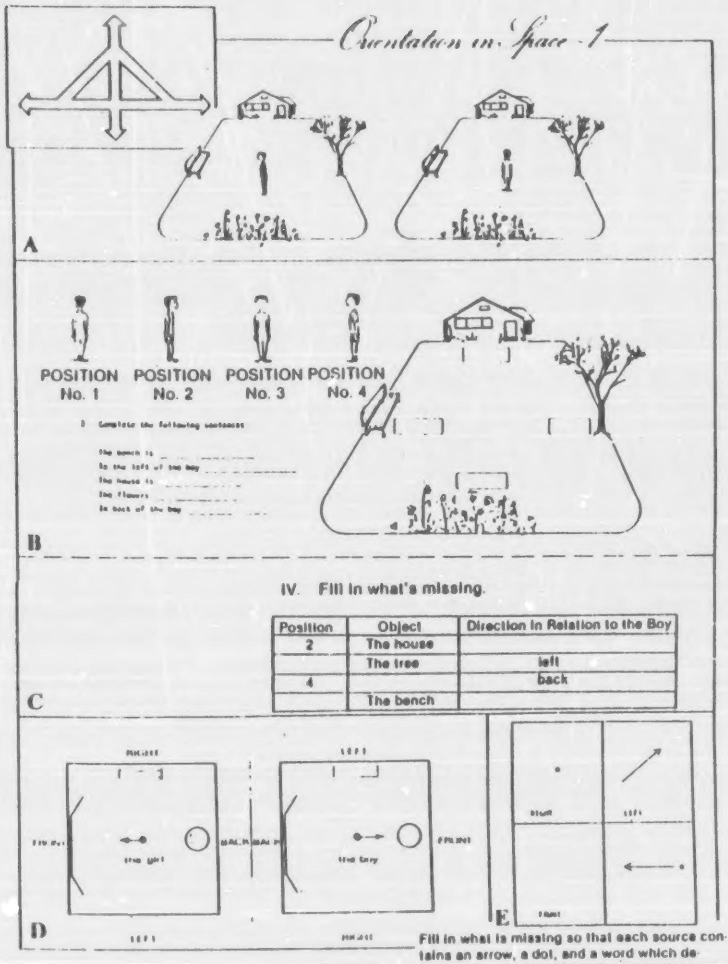
II. Acquisition of Vocabulary, Concepts, and Operations Within 2 months after the students start to learn *Orientation in Space*, they use its concepts spontaneously:

> "Teacher, do you want us to write our names in the upper left hand corner of the first page?"
>
> "Teacher, what is the third word in the fourth column from the right?"
>
> "The caption of the picture in the newspaper was wrong today. They said 'on Golda's left,' and it was really on the left of the picture but on Golda's right."

III. Production of Intrinsic Motivation Through Habit Formation The crystallization of acquired modalities of functioning by the formation of habits can be well illustrated by *Orientation in Space I*. There is ample opportunity to actively use a specific behavior in situations and tasks that do not repeat themselves. Each of the 16 pages presents the same principle in a different situation, modality of presentation, and/or mode of response. The required flexibility and generalization are produced by variations of the task in which the rule is applied (Figure 5).

What has been learned is then spontaneously applied in other subjects:

> In geography, relationships and the relative positions are used in locating places: "Germany is north of France."



IV. Fill in what's missing.

Position	Object	Direction in Relation to the Boy
2	The house	
	The tree	left
4		back
	The bench	

Fill in what is missing so that each source contains an arrow, a dot, and a word which describes the relationship of the dot to the arrow.

Figure 5. *Orientation in Space I. A:* Pages 1, 2, and 3. *B:* Pages 4 and 5. Tasks vary while situation is the same. *C:* Pages 6, 7, and 8. Format constant while referents and given data change. *D:* Pages 10 and 11. *E:* Pages 12, 13, 14, 15, and 16.

> Teacher: "What about the Isle of Rhodes off of Turkey?"
> Student: "The sea is to the south of Turkey, but the water is all around the island. That's what makes it an island."

In learning about longitudes, latitudes, the poles, and the hemispheres students invariably and spontaneously refer to lessons in FIE.

IV. Production of Reflective, Insightful Processes The immediate and correct use of appropriate referents and strategies in other subject-matter areas by the retarded performer gives evidence of the insight he gains.

> Carryover from the FIE exercises on wind and wind directions occurs in agriculture classes with the discussion of the necessity for considering wind direction and rain before planting.
>
> In nature lessons students speak of the necessity of meteorological services and wind direction for sailors, fishermen, paratroopers, and housekeepers who must hang out the laundry.
>
> A history teacher was surprised to hear his students talk of the influence of wind direction on maritime nations.
>
> A literature teacher writes of the increased empathy of her students: "Feuerstein's Instrumental Enrichment shows its influence on the affective, aesthetic and moral judgments of the child and has made a deep impression."

The student becomes aware of his ability to communicate more adequately and precisely. He gains understanding and self-confidence in his interpersonal relationships.

> A teacher corrected a student's listing of the four cardinal directions on the blackboard. The student politely said, "Excuse me, teacher. I listed them clockwise, while you listed them according to pairs. Both of us are right, but you can correct mine only if you explain why yours is preferable."

With decreased egocentricity and increased empathy, the retarded performer is able to understand how the same action can be viewed differently by two different participants, or even by the same participant at different times. Peace negotiations, such as the Arab-Israeli relations and the necessity for direct discussions, are often brought as examples.

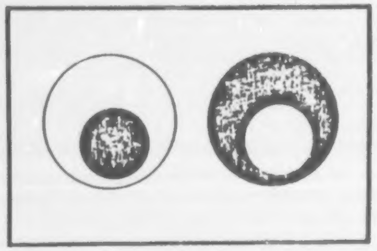
V. Creation of Task-Intrinsic Motivation The exercises are highly motivating, not only for retarded performers, but for more initiated individuals and young adults as well. In Israeli Defense Forces, noncommissioned officers who introduce basic concepts of topology report increased efficiency on the part of soldiers who have been exposed to these instruments. The same is true of marksmanship, in which students demand that corrections for aim be given in more precise and stable terms than "a little higher" or "a little lower."

VI. Change in the Attitude of the Retarded Performer from Perception of Himself as a Passive Recipient and Reproducer of Information to Perception of Himself as Active Generator of New Information Starting from the beginning of *Orientation in Space I*, and continuing throughout all three instruments, the student is offered countless opportunities to generate new information by coordinating the data offered to him. When the two or more sets of data converge or are transformed by him, he produces new information that is available to him for the adequate solution of problems or adaptation.

> A principal reported the results of a Bible test given to a class of FIE students and two other regular classes. The test was based on the first 12 chapters of the book of Joshua. The scores of the FIE students were higher than those of the other two groups. An analysis of answers showed that the FIE students had reorganized and transformed the information in the chapters. They had used spatial and temporal concepts to discuss the wars of the period. There was summation leading to categorization and the labeling of the participants in the wars, and the positions of the troops were described in relation to one another. "Joshua stationed some of his troops to the west of the Ai. His strategy was to attack from the front and from the rear."

Results similar to those in the above instance have been reported in other classes of FIE students on tests based on the exodus from Egypt and the travels of the children of Israel. FIE students described the journey according to direction, days, and sequence of events.

COMPARISONS



Among the first three instruments usually introduced in the Instrumental Enrichment program is one concerned with the development of spontaneous comparative behavior. We consider that comparative behavior is the most elementary building block of relational thinking and therefore a primary condition for any cognitive process that is to transcend mere recognition and identification.

Need for Spontaneous Comparative Behavior

Our basic contention, that the culturally deprived individual does not use comparative behavior spontaneously, does not imply that he is unable to compare nor that he does not do so in given instances. However, comparative behavior as a spontaneous manifestation is vital to enable him to become modified through direct exposure to sources of stimuli. Through clinical work, it has been found that the spontaneous use of comparison by retarded performers is limited to their most basic needs, which are not necessarily those that are relevant to academic achievement.

Comparative behavior is, therefore, one of the functions that must be corrected before the various other steps in development. Inducing comparison initially involves making the individual perceive two or more objects or events as the focus of his scrutiny. Inducing such perception is done not simply so that the individual will identify discrete entities but to facilitate the establishment of relationships between the objects of his scrutiny in terms of their differences and commonalities. The lack of spontaneous comparative behavior leaves the individual unaffected by the variety of experiences he has undergone. The success of any effort to produce a change of such a deeply ingrained pattern at the age of adolescence can only be ensured by providing a direct and systematic attack on this deficient function. The motivation of a retarded performer to compare must be enhanced through his insight into the meaning of this cognitive behavior for more pervasive adaption to academic and life situations.

The lack of spontaneous comparative behavior becomes evident with the introduction of the title page of the instrument. Students describe the figures in the symbol separately, with only a partial and imprecise enumeration of their characteristics. There is usually no attempt to project the relationships between them or to seek similarities and differences. In the rare case an attempt is made, the child lacks the verbal labels necessary to express his findings, or he does not compare the two objects on the same dimensions.

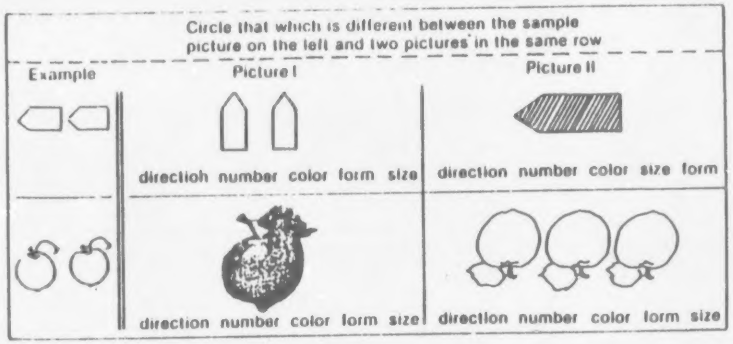
The beginning of insight into the importance of the process is illustrated in the following summary of the first lesson. The students are speaking:

> "Sometimes it seems that there is more that is alike and sometimes more that is different. It depends on how you look at it."
>
> "It depends on what is important at the moment."
>
> "Always at the beginning, it seems that everything is different."
>
> "No, that's not true. It always seems that everything is similar. But when you keep looking, you see how different things really are."

Comparison and Perception

Comparative behavior plays an important role in perception. To a large extent, it determines the nature of the perception, the acuity and sharpness of the perceived elements, and the precision with which various elements are registered. A wealth of details pertaining to a perceived object may be neglected if identification or recognition is the sole purpose of the perceptual process. However, when the individual compares spontaneously, he digs out and unravels the various characteristics of the object by an active volitional act.

We have worked with children who display great difficulty in describing the salient characteristics of an object unless they are required to contrast it with another object that is different in these dimensions. The relative nature of certain relational characteristics may also explain why an observer becomes conscious of certain attributes only following comparative behavior. Thus, *big* or *little* and *bright* or *dark* are only determined as one compares. If perceived in isolation, these particular dimensions will not be included in the description of an object.


Circle that which is different between the sample picture on the left and two pictures in the same row
Example
Picture I
Picture II
direction number color form size
direction number color size form
direction number color form size
direction number color form size

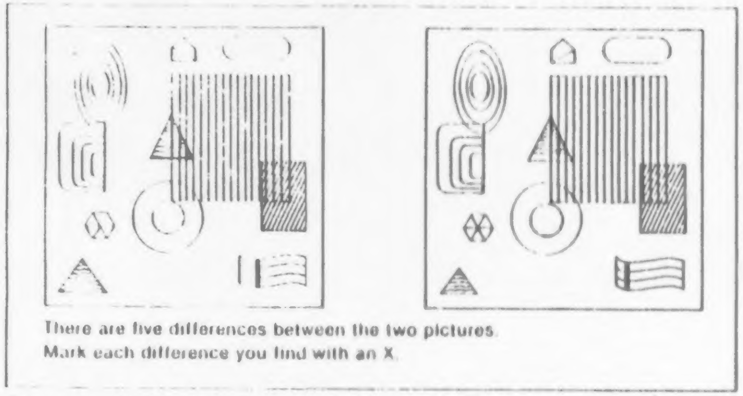
Comparisons (exercises 4 and 5, page 10)

The student is oriented toward the use of both stable and relative attributes in the comparison of items.

Process of Comparison and Its Concomitant Cognitive Functions

Comparative behavior is the abbreviation of a motor manipulation by which the two elements are superimposed, one on the other. In the process of seeking correspondence between two elements, each of the dimensions will be scrutinized thoroughly. Through this activity, there is a determination of whether the elements are identical. If they are not, there is a search for the locus and direction of the differences. Similarities and differences will be summed, and this will provide the basis for a statement describing the relationship between the two or more objects on a set of dimensions whose relevancy is directly linked to the goals set for the comparative behavior.

A number of cognitive functions are implied in the process of comparison. The first is a clear stable perception, which is not to be altered in the course of the operation. If one of the compared objects is altered, the constancies and invariants are conserved, thus ensuring the continuity of the perceived across the alteration incurred in the process itself. A second function is thorough and systematic exploration, which permits the exhaustive gathering of the data required for comparative purpose. Because systematic exploration is limited in the deprived individual, his input is apt to be poor and imprecise, and the data will depend on a random selection of elements rather than those produced by a scanning of the total field.



There are five differences between the two pictures.
Mark each difference you find with an X.

Comparisons (page 22)

Comparison requires a mental superimposition of two elements in order to ascertain similarities and differences. Successful completion of the task requires systematic search for the gathering of the complete data.

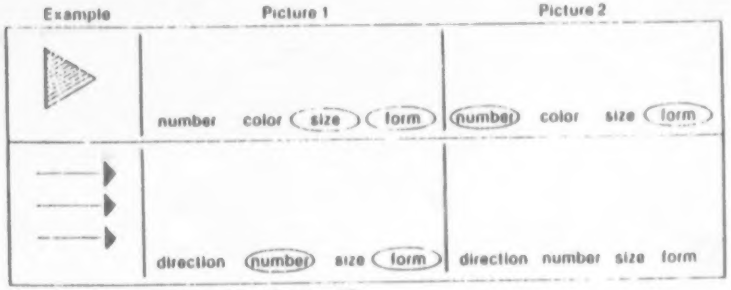
Precision

Without the need for precision, the comparing individual does not perceive an identity because his imprecise observations simplify the various dimensions of each object and produce a global, syncretic, nondiscriminating point of view that does not permit differentiation. An individual who has internalized the need for comparison has, of necessity, acquired certain strategies for gathering data that will assist him. The nature of experience and perception is far richer, more detailed, more precise, more subsumed, and more organized whenever spontaneous comparative behavior is present in either an implicit or an explicit way.

In a citizenship lesson, the teacher noted on the blackboard, at random, the characteristics of a good citizen. Her listing disturbed her students. They told her that in FIE they had learned to rank things according to their order of importance and asked her permission to use the same method in ranking the qualities of a good citizen.

Discrimination

Both stemming from and determining the nature of comparison is the process of discrimination, which permits the individual to perceive and then to formulate the differences between various objects. Many of the differences between objects are either overlooked or not perceived because the concepts necessary for such discrimination are either nonexistent or not readily elicited. This occurs because the concepts are not in current use or because no particular need to apply them makes them irrelevant for the comparative process. Thus *equal-unequal* or *similar-dissimilar* is rarely used spontaneously and is not readily elicited in these children. It is through the superimposition of the two elements to be compared that their relationship is constructed. Comparative behavior will depend on, as well as determine, the richness of the repertoire of dimensions used in a comparison.



Comparisons (exercises 1 and 3, page 12)

Solution of exercise 3 entails conclusions based on hypothetical thought, inference, and logical thinking. If a picture must be drawn that is similar to the model only in the dimensions that are encircled, what should be drawn if there is nothing circled? What about dimensions that are not mentioned at all, like color? Through a logical process one may conclude that all that is not similar must be different.

In a history lesson, the teacher asked for the similarities between Islam and Judaism. The students were not willing to accept the task as presented. They insisted that a proper comparison included both similarities and differences:

> "Both are religions. Both pray to one God whom the Moslems call Allah and whom the Jews call Hashem. Jews pray three times a day; Moslems five times. Both have Sabbath, but for Moslems it is on Friday and for Jews on Saturday. Both fast, but Jews fast only one day at a time, while the Moslems have a month-long fast. Moslems fast during the day and are allowed to eat at night while Jews must fast from sundown to sundown on important fasts."

Judgment of Similarity

Another element of this instrument concerns the judgmental process of the evaluation of ***equal-unequal*** or ***similar-dissimilar***, which occur on a continuum. Such judgment must be adjusted to the specific context and basic purpose of the comparative behavior. The specificity of a culture, of a need system, or of familiarity with a particular area will determine the similarity that is perceived. For example, an uninitiated layman would perceive two rings as similar while they would not be considered comparable by a skilled mechanic because of his finer discrimination. The number of terms used by Eskimoes for designating various types of snow, as reported by Whorf (1956), is another example of refined discriminatory processes following, as well as leading to, comparative behavior. Refined discrimination forms the standards and criteria for similarity and dissimilarity.

Ugly
Bad

Lake
River

Comparisons (exercisos 3 and 6, page 6)

> Intraclass differences are more difficult for the retarded performer to perceive and discriminate. In comparing a river to a lake or a pool to the sea, the commonality in both instances is defined as "water." The differences between them are expressed as "large" and "small." The student experiences no need for a precise differentiation and is content with gross differences.

In certain instances, the number of attributes by which things differ from one another will be used as the criterion for localizing them on a continuum ranging from identity to total difference. The dimensions on which elements are compared must be qualified and summed. Sometimes, however, a great valence is ascribed to a particular attribute so that it forms the basis for decisions as to similarity or dissimilarity between two objects, despite differences in a great number of less essential attributes. Here essentially is a function of the context within which and from which the comparative behavior stems.

> "The apple I'm thinking of is small, green, sour, and has a few spots on it that are rotten. Another is big, red, sweet, and absolutely perfect. In spite of the differences, they are both apples."

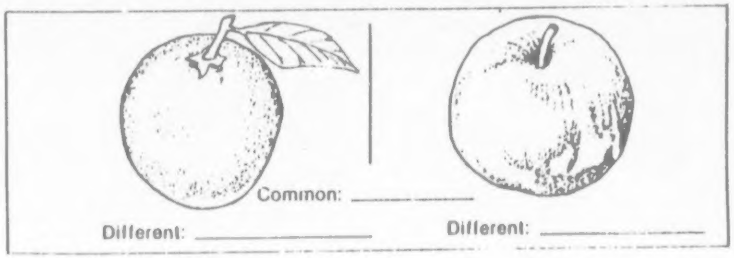
The process of judging, classifying, and establishing the relationship is an important determinant for, as well as an outcome of, comparative behavior.

Although we have stressed spontaneity, this does not mean that invoked comparative behavior does not have a role, specific to the immediate task in which the individual is involved, or that it may not be the product of a volitional, intentional, planned act. What is the energetic or dynamic factor that will provide the individual with the need for comparing and establishing relationships? The elaborational processes set goals for our perception, and, in so doing, they determine the nature of the comparative behavior.

The specific instruments designed to evoke comparative behavior establish a variety of prerequisites for relational thinking, and therefore they are preliminary to, and a preparation for, various other cognitive activities. Exercises in comparisons will have to precede those for categorization, classification, and seriation, as well as those dealing with syllogistic and transitive thinking. Emphasis on comparative behavior will appear throughout the program, but in this particular instrument the prerequisities for comparative behavior, the awareness of its importance and meaning, and the techniques for its proper use are fostered.

Content of *Comparisons*

Comparisons consists of 22 pages. The first unit introduces the concept of commonality and differences. In pictorial and verbal modalities, the exercises force comparison of two items on discrete dimensions, starting with size, form, number, and spatial and temporal concepts, and concluding with abstract attributes not immediately perceived, such as function, composition, and power. In these exercises, the student learns to seek the most relevant, most characteristic, most invariant attribute and to compare objects along the continuum of a single dimension.



Comparisons (exercise 3, page 1)

> In the above exercise, the choice of the leaf as the difference between the apple and the orange can indicate the use of an irrelevant dimension as the basis for comparison, or an impulsive response in which the input is the result of a superficial scanning. Whereas it is true that the orange does have a leaf, that characteristic is not an invariant, nor would it serve as a differentiator in all situations in which comparison between apples and oranges would be involved. Despite a superimposition of one object upon the other, and an identification of the two as belonging to the class of "fruit," there has been no attempt to define the differences in terms of membership of the same class.

A verbal modality raises the level of abstraction in the problem of finding and defining the commonality and differences.

Baby living things toothless

Old man old

Typical error—*Comparisons* (exercise 7, page 2)

Two typical errors appear in the solution of the exercise above. "Living things" to express the commonality is too broad a class. Its overgeneralization is evidence of a lack of precision and no search for relationships which are not visually perceptible. The answers for the observed differences may indicate a lack of comparison along the continuum of a single dimension.

In answer to the question "Can we compare things we cannot see?", a student replied, "Yes, like in math. 158 + 158 is the same as 158 × 2."

A girl added, "In my head I *know* exactly the kind of boyfriend I want. I compare every boy I meet with the model I have in my head. So far, I haven't found him, but I always hope that I will."

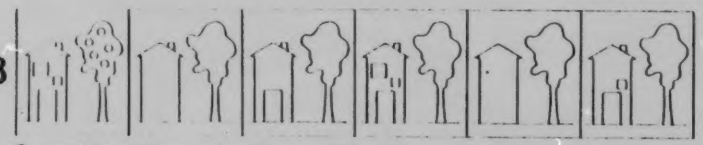
In the second unit of *Comparisons,* objects are compared to a standard along several dimensions simultaneously. Thus, the student is asked to create examples that are similar to and different from a given model according to a number of criteria, simultaneously applied (see Figure 6).

Exercises are introduced to help the student discriminate in his search for identities, similarities, and equivalencies.

A boy summarized the discussion of the difference between identity, similarity, and equivalency with the following notation on the blackboard: Identity = 3 + 5 = 3 + 5 Similarity 3 + 5 = 5 + 3 Equivalency 1 + 7 = 3 + 5.

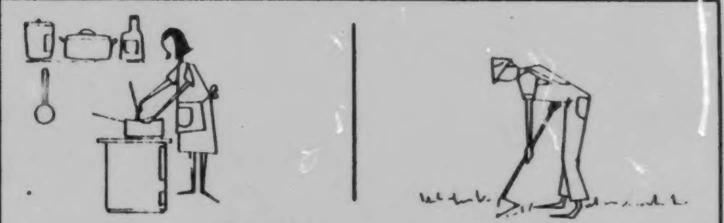
The student is also asked to rank given examples in which similarities are gradually reduced according to their proximity to a model.

3



Comparisons (excercise 3, page 21)

In the exercises of the third unit, the learner establishes classes and class membership, using inductive and deductive processes. Superordinate concepts are used to describe both commonalities and differences.



Common: ______________

Different: ______________

Comparisons (exercise 3, page 17)

Additional Anticipated Errors

Many of the difficulties that arise may be anticipated. There may be a problem of inadequate vocabulary. A learner may say, "I know that this is a boy and this is a girl, but I don't know the one word which I can use to describe that difference." The retarded performer may be satisfied with the first similarity or difference he perceives. He may use association; he may describe each of the two objects, enumerating their characteristics without making any attempt to compare them along one dimension at a time.

In a nature class the children were asked to compare birds and fish. The lists made by the children who had not learned *Comparisons* were:

Birds	Fish
Fly	Cold-blooded
Feathers	Lay eggs. Some have live babies.
Beaks	Live in water
Wings	Gills
Build nests	Swim
Lay eggs	Fins
Lungs	

The children who had learned to compare were able to organize the same information so that points of similarity and difference were defined under superordinate headings and ascertainable at a glance.

Some teachers may reveal an inability to compare properly or a rigidity which does not permit the considering of alternatives. The following classroom exchange is an illustration:

The children have been asked to find the commonality and differences between milk and salt in one exercise, and between the sun and a flashlight in another:

Teacher: "The difference between milk and salt is that you can drink two or three glasses of milk because it is good for children, but you can't drink two or three glasses of salt."

Teacher: "What is the sun?"

Student: "The sun."

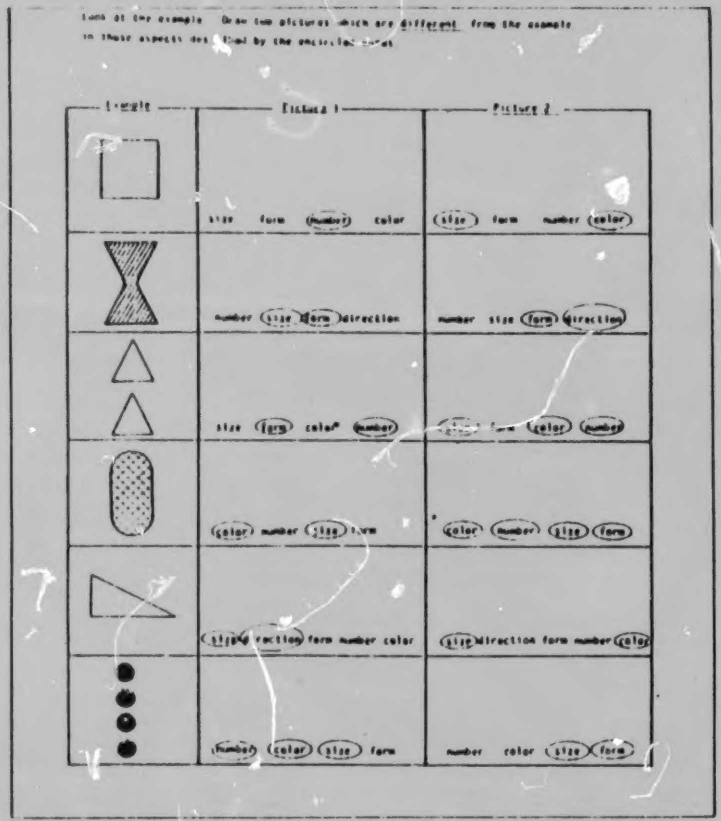

Look at the example. Draw two pictures which are different from the example
in those aspects designated by the encircled words
Example
Picture 1
Picture 2
size form number color
size form number color
number size form direction
number size form direction
size form color number
size form color number
color number size form
color number size form
size direction form number color
size direction form number color
number color size form
number color size form

Figure 6. *Comparisons* (page 14). To automatize the act of comparison, to provide the basis for classification, and to correct his episodic grasp of reality, the student learns to find similarities and differences between objects, events, and ideas. He learns to use concepts in his identification of the most essential or characteristic dimensions and to ignore the irrelevant. Among the functions treated are: blurred and sweeping perception; unplanned, unsystematic exploratory behavior; lack of verbal tools; inability to relate to two or more sources of information; narrowness of the mental field; and trial-and-error responses. The student actively creates two pictures, each of which differs from the example only in the aspects encircled, and is similar to the model on all other dimensions. The task is complicated and requires the ability to define the framework necessary for the solution of the problem, the simultaneous use of several sources of information, and a strategy for checking. Salient are the conservation of constancy and the need for planning.

> Teacher: "What does the sun give?"
> Student: "Light."
> Teacher: "What else?"
> Student: "Heat."
> Teacher: "And the flashlight?"

> Student: "Light."
> Teacher: "That's the difference. The sun gives light and heat while the flashlight only gives light."

The teacher's replies may indicate a functional definition of the relationships. Perhaps another explanation of the teacher's responses in the above exchange is a passive-acceptant approach that reflects the teacher's belief in the inability of the child to accede to a more sophisticated comparative behavior. The teacher figuratively bends to the child's presumed level instead of attempting to raise the child's level of thought by appropriate questioning. The orientation toward seeking a single right answer is also detrimental. There is no way of knowing whether a correct answer is the product of reflection and the result of a consideration of possible alternatives or a product of an expression of a probabilistic approach. With the immediate acceptance of a single answer, there is not the necessary confrontation between, and the investigation of, divergent responses.

Spontaneous Use of Comparative Behavior

The need to compare becomes internalized and the process automatized. Students begin to compare without being directed to do so.

> In a composition class, the teacher distributed pages for independent work. One of the FIE students compared the new assignment with pages he had previously done. In reply to the teacher's question of what caused him to compare, he said, "It just seemed natural that I should."
>
> FIE students learned about Holland in geography class. They immediately compared it to the United States. Some of the parameters they used were size, population, location, natural resources, trade, and attitude toward Israel.

Both insight and generation of new information are evident in the following illustrations, which indicate that progress has been made in overcoming an episodic grasp of reality.

> For social studies, students were required to watch a televised documentary series on different life-styles of different cultures. One morning an FIE student volunteered: "It seems to me that all cultures have had to face similar problems of getting married, raising children, and taking care of housing, clothing, food, and self-defense. If I compare them, I see that each has come up with his own strategy for solving the problem."
>
> In a literature class, the teacher asked if the hero of a story was strong or weak. The students immediately began to define the problem: they were being asked to set criteria of strengths and weaknesses and then to see how the hero compared to these criteria. They then decided it all depended on the point of view of the reader and the actions of the hero in his relationships with other persons in the story. The students then concluded that the question was too broad because there were instances and events in which the hero was strong and others in which he was weak: "One simply can't balance these on a scale, because some actions are more critical than others."

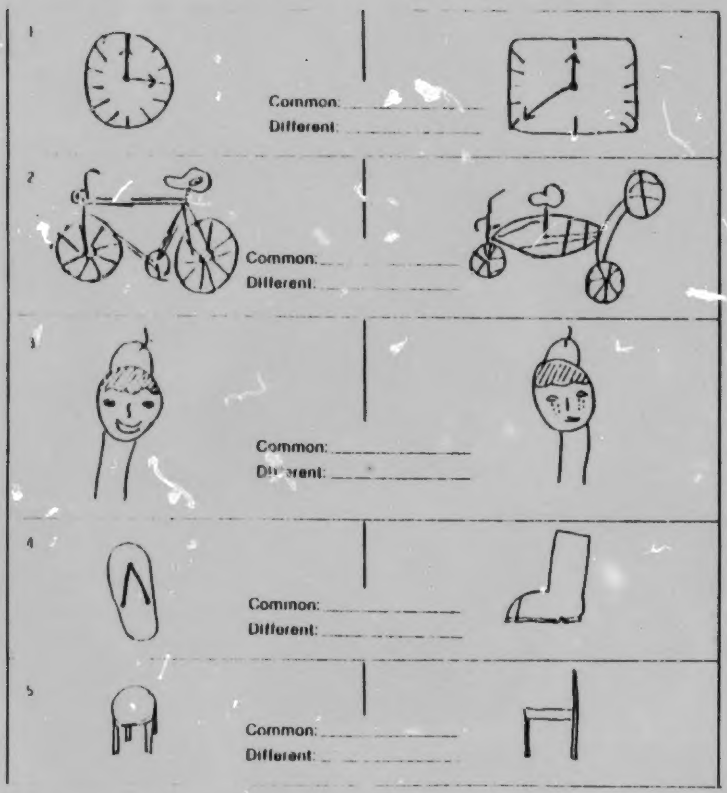

1
Common:
Different:
2
Common:
Different:
3
Common:
Different:
4
Common:
Different:
5
Common:
Different:

Figure 7 Children's productions in *Comparisons*.

Their attack on the problem evidences transfer from their learning of *Organization of Dots, Orientation in Space, Analytic Perception,* and *Comparisons.*

Children's Productions

Children have been motivated to construct pages of *Comparisons* for the use of their friends and for reproduction by the Hadassah-Wizo-Canada Research Institute (see Figure 7). In exercises 1 and 2, intraclass differences are illustrated, with the necessity for summative behavior in the perception of the differences between the clocks. Exercise 3 brings in an affective element. In exercises 4 and 5, there is a requirement for a superordinate commonality in order to form the category.

Objectives

The terminal objectives for each trainee were:

1. Mastery of curriculum materials development competencies in his/her subject matter area.

2. Mastery of in-service teacher training competencies appropriate for peer training in Liberia.

3. Completion of a learning package and development of a secondary project.

4. Demonstration of sensitivity to Liberian culture in the fulfillment of the training requirements.

Review of Training Plan

Training Week I formed the base for the applied experiences of Weeks II, III, and IV by treating the generic aspects of teaching. During this week, the training provided an orientation to the training program, an overview of the Liberian educational system, a review of teaching methodology, and instruction in cognitive learning theory with practice in the mediation of learning experiences, and curriculum materials development. A pre-training interview was conducted as part of the on-going evaluation, content selection, and self-assessment processes -- evaluative component of the training program.

Training commenced with the administration of individual interviews to assess each trainee's teacher training or university education competency and relevant experience.

The acquisition of this information facilitated the inclusion and individuation of instruction to best meet each trainee's learning needs. Continuous feedback was an essential element in the training model.

Week IV opened with written and oral feedback from the trainees on the UDC and Practicum experiences. Also, the identification of on-going learning needs was conducted at this time. Instruction in measuring educational outcomes; the planning, conducting, and evaluation of workshops; and supervision techniques was proffered. Outlines for secondary projects were developed and shared. Learning packages were completed, shared and evaluated. Finally, Week IV of the training closed with individual interviews, written training evaluations, the administration of a teaching effectiveness measure, and oral feedback geared toward the improvement of both trainee and trainer effectiveness.

The initial week of training proceeded as previously outlined. On the first day, individual interviews were conducted concurrently with the health screenings. A large group generic session was convened to introduce staff and to provide trainees with an overview of the training program, its educational objectives, and the schedules.

On day two, small-group teacher training session provided an overview of the Liberian educational system -- its history, hierarchy and protocol, and prototypes of the

Liberian schools and students. The afternoon session was a review and discussion of teaching methodologies, including Bloom, Brunner, Perry, Hunt-Sullivan, and Flanders, as related to Lbieria role expectations for PCV teacher trainers.

The third day involved the presentation of a mini-lecture on the instrumental enrichment cognitive learning theory and method for the mediation of learning experiences.

Day four was devoted to curriculum development: materials, adaptation, developing and writing instructional objectives, and development of the learning packages. The teacher training group was sub-grouped by content area into four groups: art education, adult basic education, university education and reading. Each group met with the teacher training technical coordinator to develop the learning packages.

On day five of the training, individual interview (feedback) sessions were held. The identification and development of the learning packages was discussed, evaluated and noted.

Day six was an independent resource generation day. Trainees scoured the Washington, DC area in search of relevant technical materials to incorporate into their learning packages and otherwise use as instructional aides in Liberia.

Changes in Training Plan

Week IV deviated from the outlined plan. Given the unusual weather conditions encountered during training Weeks II and III, both the UDC and Practicum learnings were thwarted. Trainees expressed an acute need for "hand on" experiences and materials given the level of their anxiety and frustration generated by feelings of inadequacy, in some cases, or precipitated by school closings and the resultant failure to meet their Practicum expectations, in many cases.

Consequently, the afternoon of day one, Week IV was spent in the field. Some trainees returned to their practicum placements for additional instruction or observation. Others sought materials from professional associations and academic libraries in the area.

On day two, all trainees met for one and a half hours with Peace Corps Director, Lorette Ruppee. The remainder of the day and half of the next was spent on a full group project.*

The purpose of the Week IV training project was threefold:

1. To provide trainees with "hands on" experiences in workshop development, curriculum materials development, and supervision.

---

*NOTE. Given the training staff's goals of individualizing training content to best fulfill the learning needs of each trainee and encouraging traninee resourcefulness as modeling behavior for subsequent performance as PCV teacher trainers, three trainees did not participate in this project but, elected to observe a reading seminar at George Mason University.

2. To provide a collaborative and team building activity that would serve as a model of how trainees could share their resources in-country.

3. To provide trainees with an opportunity to develop self-confidence in their teacher training abilities by discovering and utilizing nonobvious competencies.

Therefore, the teacher training group was partitioned into three groups on the basis of expressed learning needs, experience, and tasks demands: curriculum development, workshop presentation, and supervision. The curriculum group evaluated a unit from a Liberian first grade reader using the criteria of appropriateness to grade level, scope and sequence. They adapted the text and presented a mini-workshop on the activity. The workshop group planned, conducted and evaluated a workshop for in-service teachers using the curriculum group's product. The supervision group served as resource persons, supervised, and evaluated the other groups.

The afternoon of day three was availed to representatives of the Liberian Embassy for a large group presentation and Liberia specific discussion. Immunizations and project evaluations were administered simultaneously in the morning on day four. A teaching effectiveness measure was administered in the afternoon. On the final day of training, individual exit interviews were conducted concurrently with independent resource generation.

The rural communications trainee participated in the teacher training group during Week I. During Weeks II, III, and IV her training was specialized. She "interned" as a programming assistant to a broadcaster at a local religious radio station. (See appendix for her schedule.)

ANNEX A

GROUP A: TRAINING SYLLABUS

PSI ASSOCIATES, INC.
WASHINGTON, D. C.

TRAINING SYLLABUS

U.S. STATE-SIDE TRAINING FOR PEACE CORPS VOLUNTEERS FOR: LIBERIAN EDUCATIONAL INSTITUTIONS

JANUARY 4 - 31, 1982

__X__ GROUP A: UNIVERSITY TRAINEES (GREEN)
_____ GROUP B: VOCATIONAL INSTRUCTORS (BLUE)
_____ GROUP C: SECONDARY SCHOOL TEACHERS (YELLOW)

[illegible]
[illegible], D.C. [illegible]

(202) 659-6436

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Mr. M. Julian West
Children's Hospital National
Medical Center

P.O. Box 1445
US/AID
Monrovia, Liberia

December 24, 1981

Dear Peace Corps Volunteer:

Welcome to a situation where your personal input may make a tremendous impact. You are doubtlessly committed to the assignment. We wish you the success you deserve as you enter the field of human services in Liberia. We wish you success in sharing your knowledge, experiences and outlook on life with the teachers and students in Liberia.

Liberia, as you have been told and will have re-emphasized, is a developing country. There are many areas in this development where progress is needed, and where inhabitants are eager to come up to modern ways of doing things and of making a living.

A large part of your success will be based on how quickly you make the adjustments, which you assuredly must make to be effective in Liberia. Here are some areas of adjustments to remember:

- One adjustment you will face is when you first leave the plane. The heat is intensive. This coupled with the humidity can be frustrating and quite debilitating, if one is too eager to "get moving." When you arrive, it will be the "Dry Season." During this season, very little rain falls and the sun is extremely hot. Rushing around in the direct rays of the sun can be injurious. If you are careful, these injuries will be minimized. You will probably wonder at the way the indigenous people dress. They are more adjusted to the sun and, therefore, appear less concerned with the effects. However, your careful movements now will help you avoid problems later.

- Another area of adjustment for early consideration by you is the use of drinking water. Many times the effect of dehydration leads to a desire for a drink. It is recommended that you avoid water which has not been treated, i.e., boiled and/or filtered. You may eventually be adjusted based on the location of your work. During your health lectures, you may be instructed on chemicals to put in the water. This will help to reduce the possibilities of an upset stomach from the use of water delivered from the pipes. Be warned; care is extremely important.

- The next area for your consideration is your personal protection from mosquitoes. There is a prevelance of malaria in most areas of Liberia. Using repellants and taking your malaria suppressants will reduce the incidents of contracting this fever.

There are other areas which should claim your attention in the early part of your tour:

- You may be assigned to remote areas of the country. Living conditions are somewhat different in the interior than in the capital city, Monrovia. There are problems in Monrovia, but they are magnified in the interior. Access roads are non-existent in some areas; electricity has not reached some areas (and that which has reached is not necessarily dependable.)

- Foods you may desire regularly may be not easily available. Your adjustment to these conditions may take some effect on your part. (Rice is the staple in the Liberian diet.)

- Liberian people are friendly and outgoing. They are eager to have your assurance that there are ways of improving their situations. You will probably be welcomed by individuals who will desire to be "adopted" by you immediately. Be careful because this may be the beginning of a series of "gifts/loans" which you may not be able to easily stop. We recommend that you return "friendly" attitudes, even as you say "no," less you lose a worthy resource.

- There undoubtedly are many times where your personal attributes will serve you well. Use them to your advantage.

- One final suggestion - begin carefully in your zeal to amass the indigenous art pieces. They are interesting, well accomplished but expensive. Bide your time and you will soon learn the art of bargaining.

You will be told during your orientation about the peculiar characteristics of Liberia you will experience. One of these pertains to the political/economic situation in the country. Do not attempt to argue your political (or religious) ideas, or judge the situation in Liberia. You have a job of technical assistance, and need not hamper your cooperative efforts by delving into the political arena. The military rule is designed to change the conditions of Liberia and her people. Let them accomplish this assigned tasks. Liberia relies heavily on international donors, especially the United States. There is, however, some anti-American sentiment, among the nation's leaders. Do not take such comments personally. Do not enter into political debates on the subject. Your effectiveness is the best argument that can be made in defense of the United States.

You represent many disciplines with many years of training and experiences. These will be brought into focus as you take up your teaching stations throughout the country. You will have difficulty and personal frustration, if you attempt to change everything you see immediately. The Liberian people have survived for long time, doing things "their way." Some of your ideas may not necessarily fit unless you adjust your thinking. You, as educators, must be able to utilize some of the ideas and methods you will meet in Liberia. You must be willing to integrate the Liberian way into your own plan of operation.

Finally, let your service be one of growth for the Liberian people in your assigned area, and you too will grow daily.

The best of luck in your work, and feel free to contact PSI Associates in Monrovia, if we may assist you.

Sincerely yours,

Joseph E. Butcher
Technical Adviser,
PSI Associates, Inc.
Youth-On-The-Job Training Program (U.S. AID)
National Youth and Sports Commission
Monrovia, Liberia

PSI ASSOCIATES/UNIVERSITY OF D.C. TRAINING OBJECTIVES

1. Each volunteer will design a complete learning package with 90% accuracy to be used in their classroom in Liberia. (3 weeks).
2. Each volunteer will design two secondary projects -- one in adult literacy -- with 90% accuracy with steps for implementation appropriate to Liberia. (4 weeks).
3. Each volunteer will design and pilot test an in-serivce training package independently for their Liberian counterparts. (3 weeks).
4. Each volunteer will list with 75% accuracy the important cultural traits which will influence how they must operate in Liberia, including the role of women in development. (4 weeks).

PEACE CORPS TRAINING OBJECTIVES

1. Each volunteer will master curriculum development competencies in the subject area relevant to Liberia rural communities.
2. Each volunteer will master secondary project design, competencies and implementation appropriate for Liberia.
3. Each volunteer will master in-service teacher training design and implementation competencies appropriate for peer training in Liberia.
4. Each volunteer will demonstrate sensitivity to the cultural context of Liberia in fulfilling teaching requirements.

REQUIRED TRAINEE PROJECTS

- Classroom Learning Package - Each volunteer will design and develop a classroom learning package in their own subject area. The package will include instructional objectives, teaching strategies, evaluation method, and behavioral indicators of mastery.

- Secondary Projects (2) - Each volunteer will independently design two secondary projects, one in the area of adult literacy. The design will include the goal, the need being addressed, time period covered, materials needed, community resources needed, implementation schedule, evaluation method, and follow-up and monitoring of operations.

- In-Service Training Package - Each volunteer will design and pilot test on another volunteer an in-service training package for their Liberian counterparts. The package will contain the need being addressed, the in-service training goal, the target audience, the training materials and activities, evaluation methods, and follow-up after training.

COMPETENCIES FOR JOB PERFORMANCE: GROUP A

GROUP A: Teacher Trainers	SUBJECT MATTER UPGRADING (COMPETENCIES)	TRAINING ACTIVITIES
	1. Assess in-service training needs and teacher competencies.	1. Use interview and observation techniques to develop hierarchy of training needs for Group A peers.
	2. Develop teacher training curricula with locally available materials.	2. Prepare a learning package appropriate for Liberian teachers and using local materials.
	3. Conduct in-service training course for teachers/peers with limited resources.	3. Design and operate an in-service training workshop for peers.
	4. Organize a series of in-service training activities -- short-term and on-going.	4. Plan all logistics and scheduling for an on-going in-service training program.
	5. Evaluate the results of training and feedback to trainees.	5. Use questionnaires and observations to evaluate the in-service workshop held. (#3 above).
	6. Follow-up and reinforce training for teachers.	6. Demonstrate how to encourage peers to adopt newly trained skills in the classroom.
	7. Design and implement a secondary project based on needs assessment.	7. List secondary projects. Design 2; one on adult literacy.
(Adult Basic Education Trainers)	8. Develop adult literacy curricula and teaching materials.	8. Observe and practice teaching in adult basic education courses. Adapt materials to fit Liberian setting.
(University Education Trainers)	9. Develop college-level curricula for pre-service training.	9. Observe and practice teaching at a College of Education. Assume leadership role in planning pre-service teacher training.

HOW THE SCHOOL SYSTEM WORKS IN LIBERIA

Prepared By: Mr. Joseph E. Butcher
PSI Associates, Inc./
Monrovia, Liberia

Most schools in Liberia are under the jurisdiction of the Ministry of Education. Teachers are hired, and then assigned to the various districts by the Ministry. Some nepotism enters into these assignments.

Supervision is left to the local school level. Superintendents vary widely in competence as administrators and as educational leaders in the district. Their appointments are also done by the Ministry of Education.

Supplies and materials are scarce, especially in the interior. Books are purchased by the students on the open market. Books are very expensive and often seriously out of date. American textbooks are used extensively. There is a tremendous need to supplement the texts with teacher-made learning activities packages.

There are some consolidated school districts. The largest is the Monrovia Consolidated School System which operates the public schools in Monrovia. In addition to the academic schools, there are vocational schools. These secondary schools prepare students for skilled trades jobs in industry. Most large employers supplement the school vocational training with their own on-the-job training programs. Many excellent vocational teachers work in these private vocational training programs.

Private schools are generally better run and more highly regarded as educational institutions, than are public schools in Liberia. Private schools charge tuition, which in some cases is very high. Private school students as a group perform better than public school students on the National Exams. These scores are important for college training.

The Ministry of Education has as a stated goal -- to improve the public school curricula. This reform has been extremely slow because of lack of qualified teachers, and lack of money to institute large scale reforms.

The guidance and counseling programs are extremely weak. Students rely on family tradition, family contacts, and peers in deciding what educational path to follow.

Instruction relies heavily on rote methods of training. Some audio-visual equipment is available. But, there are few teachers trained in producing the types of audio-visual products the students need. Unfortunately, there are instances where the audio-visual equipment is simply stored in the school, and allowed to deteriorate in the humidity.

In general, if one were to assess the instructional program in Liberian public schools, it might be as follows:

- Math Training .... Low
- Reading Training .... Low
- General Comprehension .... Low
- English Language .... Fair
- Vocational Training .... Fair

There is one large state university -- University of Liberia -- located in Monrovia. The demand for places far exceed the capacity of the institution.

Like all Liberian ministries, the Ministry of Education has very little money to work with. It relies heavily on international donors, such as U.S. Agency for International Development, Peace Corps, World Bank, and other countries, such as Germany, Libya, and Japan for assistance.

The current government came to power through military take-over in April 1980. The current government has publically stated its determination to eradicate illiteracy and to improve the quality of life in the interior. The Ministry of Education's mission is, in part, to improve schools in the interior. The Peace Corps provides a significant cadre of teachers to work in the interior as a part of this mission.

OVERVIEW OF WEEK 1

Week 1:

(a) Orientation to Washington, D.C. and the training program, and health screening by National Medical Association Foundation Plan, Inc./ Shaw Community Health Center.

(b) Evaluation of teaching competencies (adapted from list of teach competencies developed by Ohio State University National Center for Vocational Education).

(c) Teacher training introduction and review.

(d) Cross-cultural training (including child health and nutrition needs).

(e) Secondary projects - introduction.

Outcomes for Week 1:

Each volunteer will have strengthened their pedagogical skills.

Each volunteer will begin to define their 3-mandated projects.

TEACHER TRAINING

TRAINING PLAN

GROUP A

AGENDA - WEEK I

Monday, January 4, 1982

9:00a.m. - 12:00noon: Individual interviews at Shaw Community Health Center

12:00noon - 2:00p.m.: Lunch

2:00p.m. - 5:00p.m.:

1. Orientation
2. Review of Schedules
3. Review of Syllabus
4. Identification of Educational Goals

Tuesday, January 5, 1982

9:00a.m. - 12:00noon: Overview of Liberian Educational System

1. History
2. Hierarchy and Protocol
3. Prototype of Schools
4. Prototype of Students
    a. learning style
    b. student work samples
    c. classroom management

12:00noon - 1:00p.m.: Lunch

1:00p.m. - 3:00p.m.: Review of Teaching Methodology

1. Bloom
2. Hunt
3. Perry
4. Bruner
5. Flanders

3:15p.m. - 5:00p.m.: Discussion of Liberian Role Expectations for PCV T.T.

Communication and Observation Skills

AGENDA - WEEK I

Wednesday, January 6, 1982

9:00a.m. - 12:00noon: Instrumental Enrichment (IE)
- Lecture
- Discussion

12:00noon - 1:00p.m.: Lunch

1:00p.m. - 5:00p.m.: "Hands-on" Activity and Practice: Mediated Learning Experience (MLE)

Thursday, January 7, 1982

9:00a.m. - 12:00noon: Curriculum Development
- Materials adaptation
- Developing and writing educational objectives
- Tasks Analysis
- Integration of IE with subject matter content

12:00noon - 1:00o.m.: Lunch

1:00p.m. - 5:00p.m.: Subject Matter Specific Curriculum Development
1. Art education
2. Adult basic education
3. University education
4. Reading

Friday, January 8, 1982

9:00a.m. - 12:00noon: Trainer education and feedback (individual interviews)

Identification of Instructional Packages

12:00noon - 1:00p.m.: Lunch

1:00p.m. - 5:00p.m.: Instructional Package Development (Activity)

TEACHER TRAINING/ UNIVERSITY EDUCATION

SYLLABUS

Davis, Larry and McCallon, Earl. Workshops: Planning, Conducting, Evaluating. Texas: Learning Concepts, 1974.

Durojaiyl, M.O.A. A New Introduction to Educational Psychology. London: Evans Brothers Limited, 1978.

Ekwall, Eldon E. Diagnosis and Remediation of the Disabled Reader. Boston: Allyn and Bacon, Inc., 1977.

Feuerstein, Reuven. Instrumental Enrichment. Baltimore: University Park Press, 1980.

Feuerstein, Reuven. Just A Minute .... Let Me Think! Baltimore: University Park Press, 1980.

Gay, John. Red Dust On the Green Leaves. Connecticut: Inter-Culture Associates, 1973.

Grant, Margaret. School Methods With Young Children. London: Evans Brothers Limited, 1978.

Groundland, Norman E. Stating Objectives for Classroom Instruction. New York: MacMillian, 1970.

Hough, John B. and Duncan, James K. Teaching Description and Analysis. Massachusetts: Addison-Wesley, 1970.

McGregor, G. P. English in Africa. Great Britain: UNESCO, 1971.

Tuckman, Bruce. Measuring Educational Outcomes. New York: Harcourt, Brace, Jovanovich, International, 1975.

West, Gail. Teaching Reading Skills in Content Areas. A Practical Guide to the Construction of Student Exercises. Oviedo, Florida: Sandpiper Press, 1978.

TEACHER TRAINING SUPPLEMENTARY MATERIALS

Azango, Bertha. Vocational Guidance for Liberian Schools. London: MacMillian, 1966.

Badio, Josephine Greaves. Naweh and Somah. Monrovia, 1976.

Background to Liberia. Ministry of Information, Republic of Liberia, 1979.

Beihler, Robert F. Psychology Applied to Teaching. Houghton-Mifflin. Boston, 1974, Chapters 11, 12, and 28.

Education Course Syllabus. Extension School Program, Ministry of Education.

Grangopadhyay, S. R. Handbook of Suggestions for Teachers in Small Rural Schools. Monrovia, 1977.

Lashley, Marilyn, et al. Instructional Aids Through the Use of Indigenous Materials. Peace Corps/Liberia, 1980.

Liberian Literature Grade 11. Ministry of Education, Monrovia, 1979.

"Philosophy of Liberian Education." The National Education Plan, 1978-1990. Ministry of Education, Republic of Liberia.

Revised National Curriculum, Grades I-VI, Curriculum and Instructional Materials Development Center, Monrovia 1979.

Spell, G. Robert, Kibler, Parks, "A Comparison of Mastery and Traditional Learning Systems with Selected Implications for Speech Communication Instruction" Paper presented at the meeting of the International Communication Association, Atlanta, Georgia, April 1971.

Sprinthall, Richard and Sprinthall, Norman. Educational Psychology: A Developmental Approach, Chapter 7, Addison-Wesley, 1977.

Special

Training Syllabus

Group A - 1
Communications Evaluation

Michelle Washington
Peace Corps Trainee

Field Placement Supervisor:

Dr. Charles L. Sanders
Director of Public Affairs
Host/Producer: Nu-Horizons
WYCB Radio (A religious - oriented radio station aimed at the minority market)

Training Period

January 3-27, 1982

Field Placement: WYCB Radio 1340 AM
National Press Building
529 14th Street, N.W.
Washington, DC 20045

Schedule

Monday through Friday
6:30 a.m. to 11:00 a.m.

Assignments

1. Programming and News

Duties: Traffic Reporter - On Air.
News Editing and Radio News Programming
Write News Stories

Skills: Organizing and planning material.
Interpreting information.
Establishing and maintaining good rapport with diverse staff, and audience requests.
Using writing and editing skills.
Producing and broadcasting with knowledge of national and local news, and of WYCB procedures.

Monday, Wednesday, Friday
11:30 am. to 1:30 p.m.

2. Program Concepts and Production

Duties: Prepare, research and plan programs for Nu-Horizons on "Strong Marital Bonds Among Black Marriages." Contact guests.
Assist in music research and poetry. Assist in developing scripts and interviewing questions for guests.
Prepare program layout.

Skills: Organizing, planning, coordinating writing and researching in specific subject areas.
Using creative concepts and production techniques for multi-dimension audio measures.
Designing programs.

Tuesday and Thursday
11:30 a.m. to 1:30 p.m.

3. Project Development

Duties: Planning and programming assistance for remote broadcasting of National March on Martin Luther King National Holiday.
Act as member of press with WYCB remote participation and field operation.

Skills: Developing programs and radio projects.

Monday through Friday 2:30 p.m. to 4:00 p.m.	4. Research and Development Duties: Use research libraries at University of Columbia, Howard University-Mooreland-Spingarn, Martin Luther King Public Library. Read background materials on Audience Research, Program Evaluation Needs Assessment, Survey Sampling and other related activities for performance as Evaluative Specialist in Rural Communications. Skills: Research, planning and developing evaluative skills for administrative and audience.

Field Trips (Planned)

a. Visit to: Voice of America African Division: Music Director, Leo Sarkisian, (has spent 10 or more years in Liberia, producing programs for Liberia Radio sponsored by VOA); at United States Information Agency, Health and Human Services Building, 4th and Independence Ave. S.W, Room 3029 Phone 755-4780; Also: Marilyn Silvey, VOA Director of Field Services, and other selected VOA staff knowledgable about Liberia.

b. Liberian Embassy, Washington D.C. not a priority, give the recent arrival of new appointees and political conditions in Liberia.

c. National Public Radio: Jeff Rosenberg, and Mike Epstein.

d. World Bank: Paul Danquah, Information Officer, 1776 Pennsylvania Ave. N.W., Phone: 676-1630; and Aledra Allen, 676-9011.

Evaluation

Final evaluation will be conducted by Dr. Sanders, based on mastery of skills and completion of assignments. Evaluation report will be completed January 26, 1982.

OVERVIEW OF WEEKS 2 AND 3

Weeks 2 & 3:

(a) Subject - area upgrading at UDC College of Education.

(b) Practice teaching in inner-city schools.

(c) Continued secondary projects training.

(d) Cross-cultural training.

(e) Mid-project evaluation of volunteers.

Outcomes for Weeks 2 & 3:

Each volunteer will have completed one instructional package to be used in their classroom in Liberia.

Each volunteer will have completed one in-service training workshop for their Liberian counterparts.

EXPERIENTIAL TEACHER TRAINING FOR PEACE CORPS VOLUNTEERS

Group A: Adult Education/Adult Literacy

Jeanne Evans Lea, Ed.D.
University of the District of Columbia

Peace Corps Training Objectives (from Proposal)

PSI/UDC Training Objectives (from Proposal)

Competencies for the Job

The ability to devise and demonstrate effective training techniques for adults/adult educators

The ability to create relevant materials for teaching adults

References/Reading Materials

Evans, James L. Principles of Programmed Learning. TMI-Grolier, 1962.

Grotelueschen, Arden D. et al. Evaluation in Adult Basic Education: How and Why. Danville: Interstate Printers and Publishers, 1979.

Kepner, Tom and Lanny Sparks. Objectives Marketplace Game. National Special Media Institute, 1972.

Kibler, Robert J. et al Objectives for Instruction and Evaluation. Boston: Allyn and Bacon, 1974.

Knowles, Malcolm. An In-depth Interview with Steve Becker (tapes) Boston: Learncom, Inc., 1978.

# 2 Andragogy vs. Pedagogy/Self Directed Learning
# 3 Andragogy: How Adults Learn

Popham, W. James. Vimcet Series (Filmstrips and Tapes)

# 3 Selecting Appropriate Educational Objectives
#10 Identifying Affective Objectives
#28 Humanizing Educational Objectives

Course Content

To develop or strengthen the competencies listed above, the trainees will be provided a series of experiences that will enable them to structure and evaluate a functional instructional system that will synthesize knowledge and application of the following:

- The nature of the adult learner and adult learning;
- Performance objectives stated in terms of (a) learner performance, (b) learning conditions, (c) expected learning extent and (d) taxonomic variables;
- Creation of assessment tools to (a) diagnose learning difficulties, (b) design instruction, (c) evaluate performance objectives;
- Relation of competency development to varied learning systems.

Course Content - continued

Monday Assessing Adult Educator Competencies

Discussion: How Adults Learn: Andragogy vs. Pedagogy

Analysis of Adult Teaching Competencies
Prior Learning via Functional Competencies

Tuesday Functions of Instructional Systems
Structuring PERFORMANCE Objectives

Wednesday Creating Assessment Tools
- Diagnosis
- Designing
- Evaluating

Thursday Structuring Learning Experiences

Friday Structuring/Demonstrating Learning Experiences

Week 3 Field Setting

The field experiences will provide the trainees with opportunities to test and reassess the materials they have designed; identify additional material resources and adapt selected materials for their future use; collect materials for future use.

Evaluation

Evaluation will parallel the objectives and will be conducted daily.

University of the District of Columbia
College of Education & Human
Ecology

&

D.C. Public Schools

A Training Workshop
Groups A and C:
Mathematics & Science Teachers

Mini Course on Technical Skills in Mathematics and Science

Instructors: Beverly J. Anderson, Ph.D.
Mildred Lockhart, Ph.D.

Phone: 364-6000

Objectives of Course - The learner will become acquainted with instructional strategies for teaching concepts, processes, etc. in mathematics and science. The learner will also analyze all learning in the mathematics and science classrooms in terms of three sets of characteristics - characteristics of the learner, characteristics of the instructional materials and characteristics of the material to be learned.

The concentration of teachers in Liberia will be in the areas of Mathematics and Reading. The students in this workshop will be prepared to teach mathematics and science in the secondary schools. Mathematics is the language of science and often explains science technology and is the basis of scientific literacy. The theory taught will be related to the development and exposure of the students mathematics and scientific instructional aids

Note: An effective teacher is one who understands thoroughly what is being taught and who sets up learning situations so that each student can learn in the most effective manner.

Students:
This course is designed for prospective secondary school teachers of mathematics and science in Liberia, Africa.

Schedule:
This course is scheduled to meet from 9:00 a.m. - 3:00 p.m., Monday thru Thursday (January 11-14, 1982) and Monday thru Friday (January 18-22, 1982).

Course Requirements:
(a) The student will read and discuss 15 articles on Secondary School Mathematics and Science.

(b) The students will prepare 4 reports on classroom observations.

Report 1. Classroom Environment
Report 2. Behavioral Objectives
Report 3. Learning Activities
Report 4. Assessment Tasks

(c) The student will develop and implement 2 lesson plans.

(d) The student will develop a learning package.
(e) The student will develop a a resource file

Article:

1. Do Teachers Understand Learning Theory?
   C. A. Weber

2. Gagne' on the Learning of Mathematics A "Product" Orientation
   Robert M. Gagne'

3. Bruner on the Learning of Mathematics - A "Process" Orientation
   Jerome Bruner

4. Psychological Controversies in the Teaching of Science and Mathematics
   Lee D. Shulman

5. Peaget on the Learning of Mathematics
   Irving Adler

6. Piaget and Science Education
   David Elkin

7. Goals and Objectives of Mathematics Education
   D. Johnson & G. Rising

8. What Makes a Good Teacher
   Dan Hamachek

9. Why Use Instructional Materials in the Mathematics Classroom
   Donavan Johnson

10. Testing in Mathematics: Why? What? How?
    M. Epstein

11. More on Testing - Some Specific Suggestions

12. "Take Home" Tests
    Florence Elder

13. Formulating Objectives for Elementary Science
    Ronald Anderson

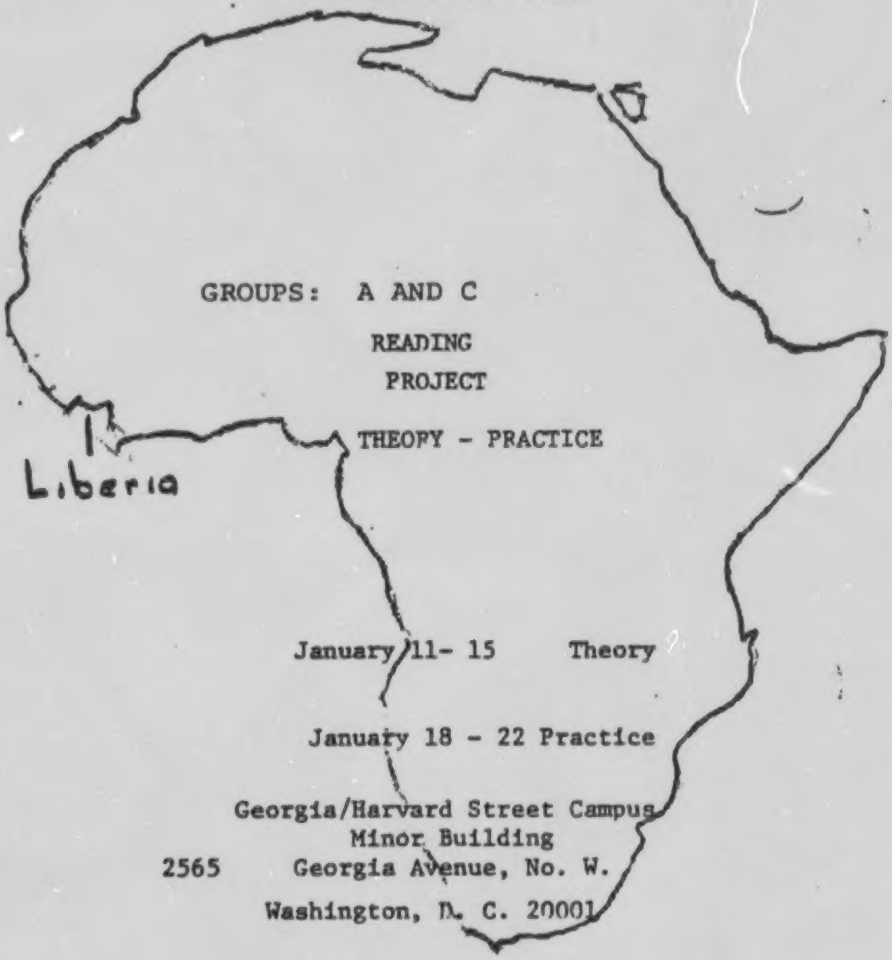
Mager, R. Preparing Instructional Objectives Belmont, California. Lear Siegler Inc., Fearon Publishers, 1973.

PACE SHEET DATE (1982):	**TOPIC:**
Monday, January 11	Instructional Theories in Mathematics and Science -- Discuss Articles 1-5
January 11-14	Interaction with Instuctional Material
Tuesday, January 12	Developing and Evaluating Instuctional Materials and Teaching Aids -- Discuss Articles 7-8 Interaction with Instructional Material
Wednesday, January 13	Developing Plans, Mager, R. -- Discuss Articles Interaction with Instructional Material
Thursday, January 14	Assessment Techniques -- Read Articles Interaction with Instructional Material
Friday, January 15	Holiday - Martin Luther King's Birthday Read Articles
Monday, January 18	Orientation Session Morning in Public Schools - Tour of Physical Plant Afternoon at 3 Classroom Observation Prepare Report on the Classroom Environment
Tuesday, January 19	Classroom Observations in Public Schools Prepare Report on Behavioral Objectives Prepare Lesson Plan for 1 Class
Wednesday, January 20	Observation Teach 1 Class 1-3 Discuss Learning Package for Thursday Prepare Learning Package for 2 Classes
Thursday, January 21	Observation Teach 1 Class
Friday, January 22	9-11 Teach 1 Class 11-12 Wrap-up Session

University of the District of Columbia
College of Education and Human Ecology
and
D. C. Public Schools

Present

A TRAINING WORKSHOP



GROUPS: A AND C

READING PROJECT

THEORY - PRACTICE

January 11- 15 Theory

January 18 - 22 Practice

Georgia/Harvard Street Campus
Minor Building
2565 Georgia Avenue, No. W.
Washington, D. C. 20001

Dr. Laura J. Smith
Associate Professor - UDC

INTRODUCTON

The successful teacher, in no matter what country, is one who assesses pupil's strengths, skill needs, modalities and interests, and plans and executes meaningful activities which promote the upward mobility of said pupils from the level identified in the assessment. In reading, there are five major areas: reading readiness, word perception, including vocabulary, comprehension; study skills, and content area skills. This theoretical/practical training workshop provides an opportunity for trainees to sharpen and augment their skills in both diagnostic and prescriptive strategies in all of the areas mentioned.

This experience is designed for prospective secondary trainees to gain both theoretical knowledge and experiential competence in those specific reading methodologies. Performance objectives have been designed in three broad areas: content knowledge, behavioral skills and human relation skills. The design provides a framework for individualized instruction and application of theory to practice.

BEHAVIORAL OUTCOMES

The student/trainees will be able to:

Develop a philosophy of reading as it relates to the content area

Assess pupil's strengths and needs in specific skill areas

Identify the range of reading achievement in secondary schools and demonstrate knowledge of basic constructs underlying a secondary reading program

Develop a variety of classroom strategies for reading in content areas: namely: Reading Study Guides, Directed Reading Activity, Modified Language Experience Approach, Questioning Strategies, Use of Newspapers, Sustained Silent Reading, Contracting, Advanced Organizers, Cloze Games

Demonstrate knowledge of the use of readability formula and ability to utilize at least one of several (Fog, Smog, Cloze, Fry)

Interpret diagnostic instrumnents for teaching to the strengths of pupils

Demonstrate knowledge of planning and implementing content area lessons that incorporate viable reading skills

Demonstrate knowledge and skill to differentiate content material for the diverse learning levels of students

Demonstrate an understanding of the interrelatedness of word analysis skills and comprehension skills and the limitation of word analysis in isolation

Exhibt an understanding of the complex nature of the reading thinking process

Determine instructional strategies to reflect the skills needed by students

Develop and use games, manipulative teacher made devices and activities appropriate for diagnostic teaching

Exhibit knowledge of professional references

Objectives:

A. Understanding the Need for Reading: Rationale for Place in Secondary School

1. Perceive the role of secondary content teacher as responsible for meeting the needs of his secondary students.

2. Demonstrate orally knowledge of basic constructs underlying good secondary reading programs.

3. List the values of effective functional reading skills for youth and adults.

4. Determine if role perception of incorporating reading methodologies in content areas meshes with per-

5. Analyze reasons for continued reading instruction and guidance in secondary schools.

6. Differentiate in writing a knowledge of developmental, corrective and remedial programs.

7. Demonstrate orally and in writing knowledge of reading research and innovations in content area reading.

8. Identify uses of reading and roles of reading in modern life.

B. Understanding the Meaning of Reading

1. Explain the complex nature of the reading thinking process.

2. Demonstrate an understanding of language learning and thought as they relate to the reading meaning process.

3. List and describe reading skills that are prerequisite to teaching subject matter material: comprehension, concepts, vocabulary, word recognition, reading rate and flexibility, research study skills.

4. Display positive attitudes toward fostering respect for recreational reading as well as informational reading.

C. Understanding the Learner

1. Identify and list educational and non-educational causes of reading disability.

2. Examine personal feelings toward learner who has problems in reading in secondary schools.

3. Evidence knowledge of related psychological, sociological, physiological factors that restrict reading achievement.

4. Show familiarity with techniques for motivating students to want to read and enjoy reading.

5. Exhibit competence and knowledge of interpretation of diagnostic instruments used to determine instructional level.

6. Develop a theoretical and personal knowledge of adolescents and meet them on a professional basis.

7. Prepare informal reading instruments to assess reading interests preferences, strengths and needs of adolescents.

8. Identify and explain techniques for individualizing instruction to meet the needs of learners.

D. Understanding the Appropriate Strategies

1. Demonstrate competence in assisting students with information acquisition: locating, organizing, categorizing and remembering content material.

2. Evidence competence and knowledge of understanding necessary for written reports.

3. Describe and implement a variety of classroom strategies for improving comprehension, concepts, vocabulary and research and study skills: Reading Study Guide, Cloze Procedure, Rewriting Materials, Sustained Silent Reading, Use of Questioning, Chunking, Contracting, Directed Reading Thinking Activity, Games, L.E.A.

4. Demonstrate knowledge of planning and implementation of content area lessons that incorporate viable reading skills.

5. Describe organizable patterns of writing in specified disciplines.

6. Exhibit required qualities of creativity, resourcefulness, humanism and dependability requisite to successful classroom teaching.

7. Assist students in surveying and setting purposes for reading.

8. Exhibit skill in decision making for provision of

E. Understanding the Appropriate Use of Materials

1. Adopt a philosophy about textbook selection and usage in secondary classrooms.

2. Evidence familiarity with wide variety of materials appropriate in secondary classrooms (manuals, workbooks, charts, multimedia, and other supplementary materials.)

3. Demonstrate knowledge of how to calculate the readability level of textbooks in your content area.

4. Demonstrate knowledge and skill to differentiate content material for the diverse learning levels of students.

5. Identify and explain the essential organization structure of a standard textbook series used in the secondary school in your subject matter field.

Resources:

Burmeister, Lou E. *Reading Strategies for Secondary School Teachers*. Addison Wesley Publishing Co., Reading, Massachusetts, 1974.

Cushenbery, Donald C. *Remedial Reading in the Secondary School*. Parker Publishing Co., West Nyack, N.Y., 1972.

Dechant, Emerald. *Reading Improvement in the Secondary School*. Prentice Hall, Englewood Cliffs, New Jersey, 1973.

Dietrich, Dorothy M. and Virginia H. Mathews. (eds.) *Reading and Revolution*, Newark, Del. The International Reading Association, 1970.

Dillner, Martha H. and Olson, Joanne P. *Personalizing Reading Instruction in Middle, Junior, and Senior High Schools*. Macmillan Publishing Co., New York, 1977.

Duggins, James. *Teaching Reading for Human Values in High School*. Columbus, Ohio: Charles E. Merrill Publishing Company, 1972.

Forgan, Harry W. *Teaching Content Area Reading Skills*. Ohio: Charles E. Merrill, 1976.

Gambrell & Wilson, Robert. *Focusing on the Strengths of Children*. Fearon Publishing, Belmont, California, 1973.

Gililand, Hap. *A Practical Guide to Remedial Reading*. Ohio: Charles E. Merrill, 1974.

Hafner, Lawrence E. *Improving Reading in Middle and Secondary Schools*. Selected Reading, Macmillan Publishing Co., New York, 1974.

Hafner, Lawrence E. (Ed.) *Improving Reading in Secondary Schools*. Selected Reading, New York: Macmillan,

Name ____

JUST A MINUTE ...
LET ME THINK !

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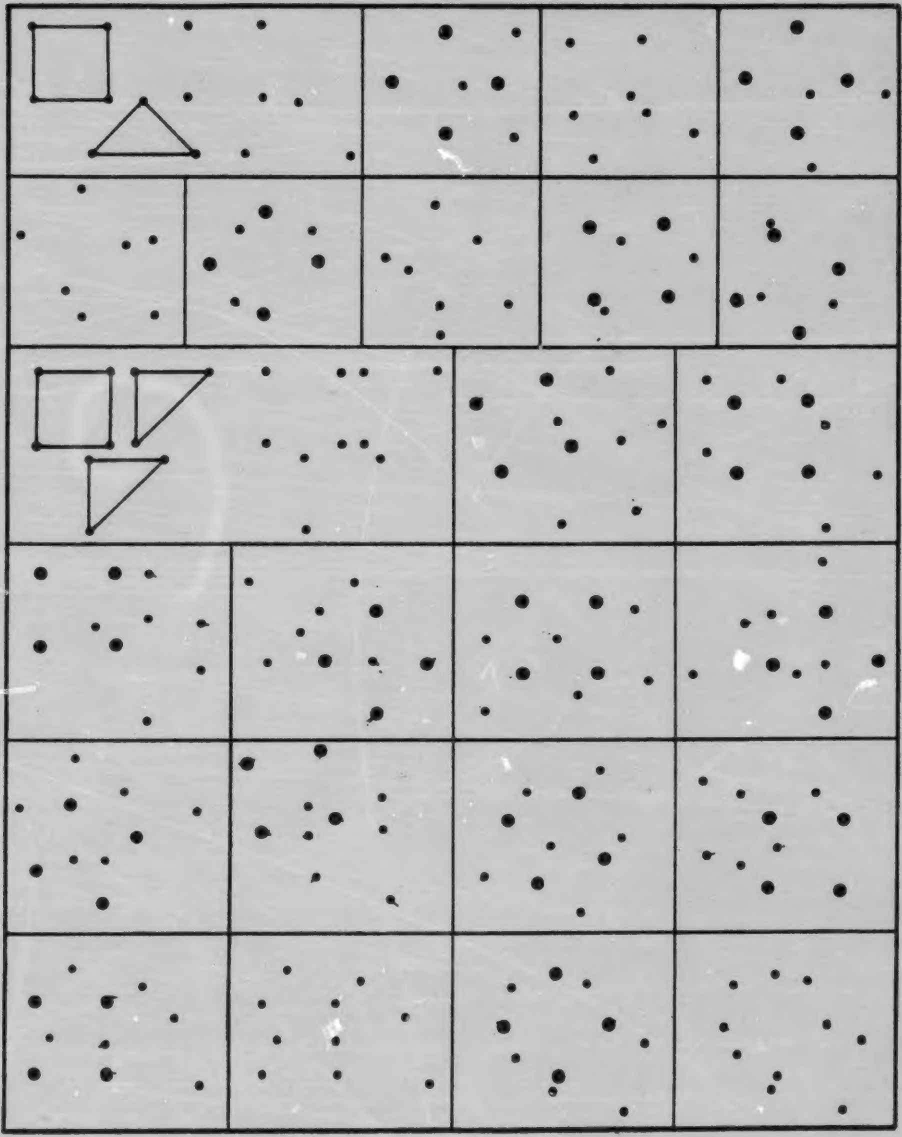

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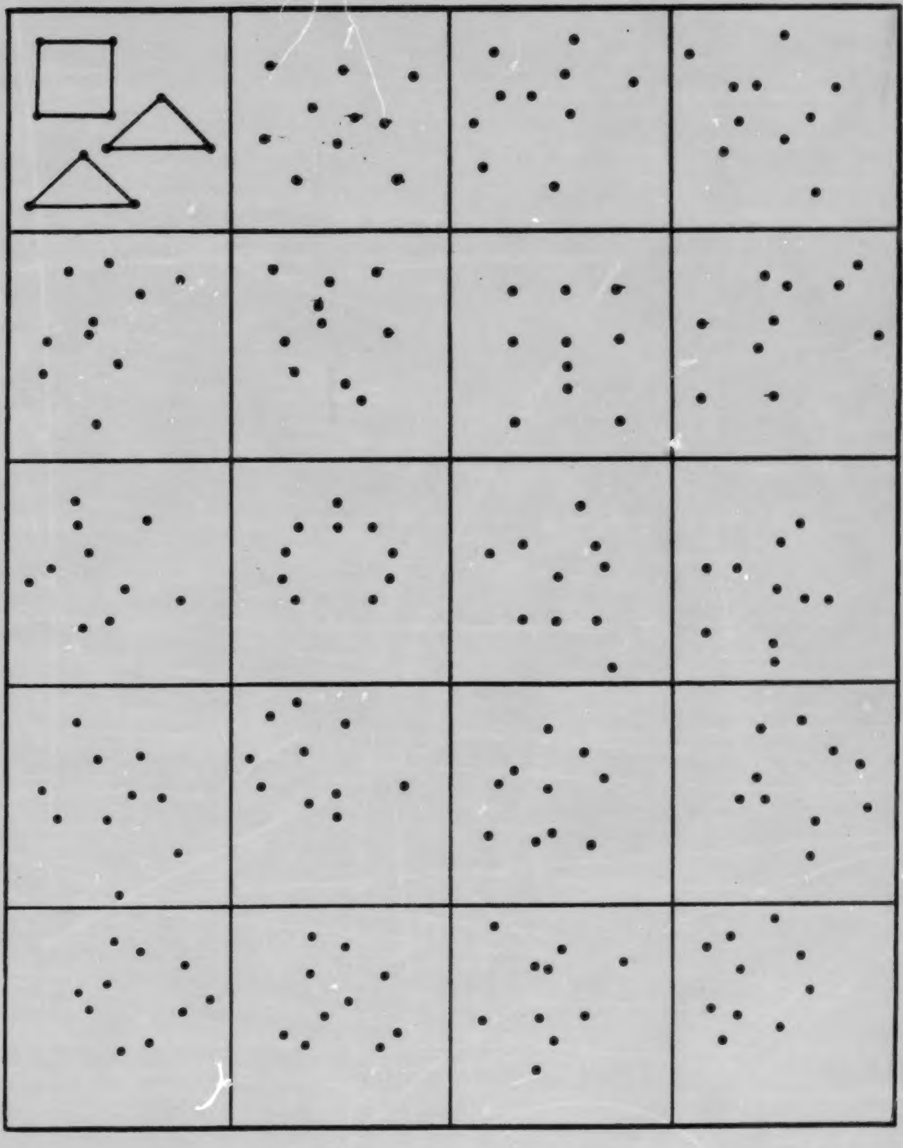

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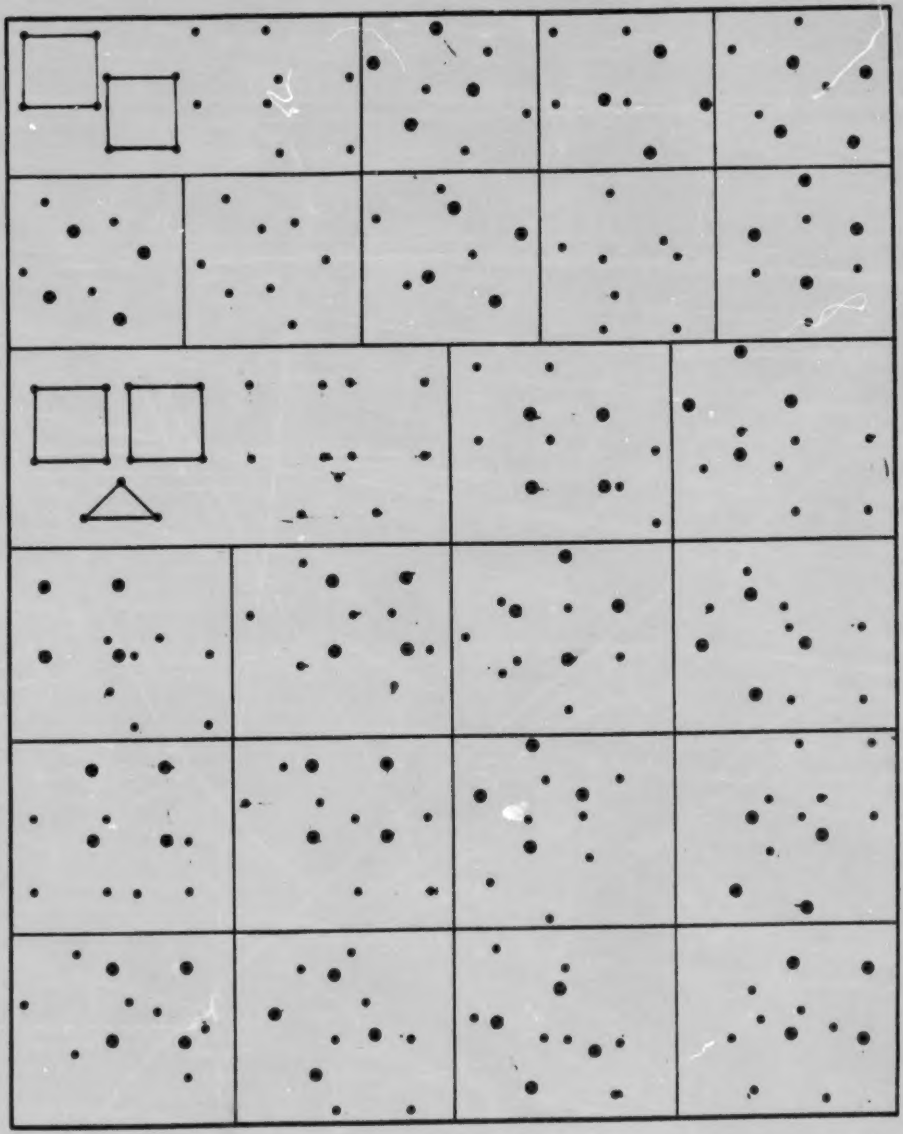

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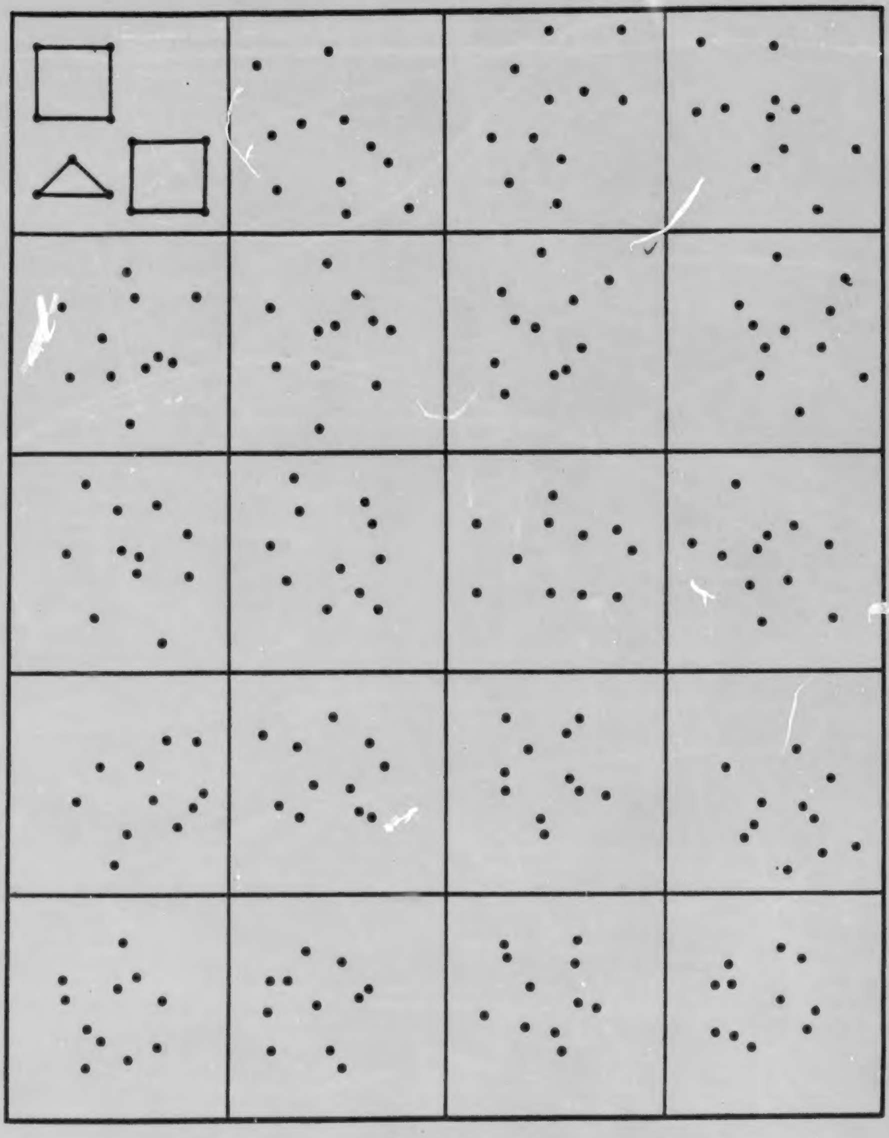

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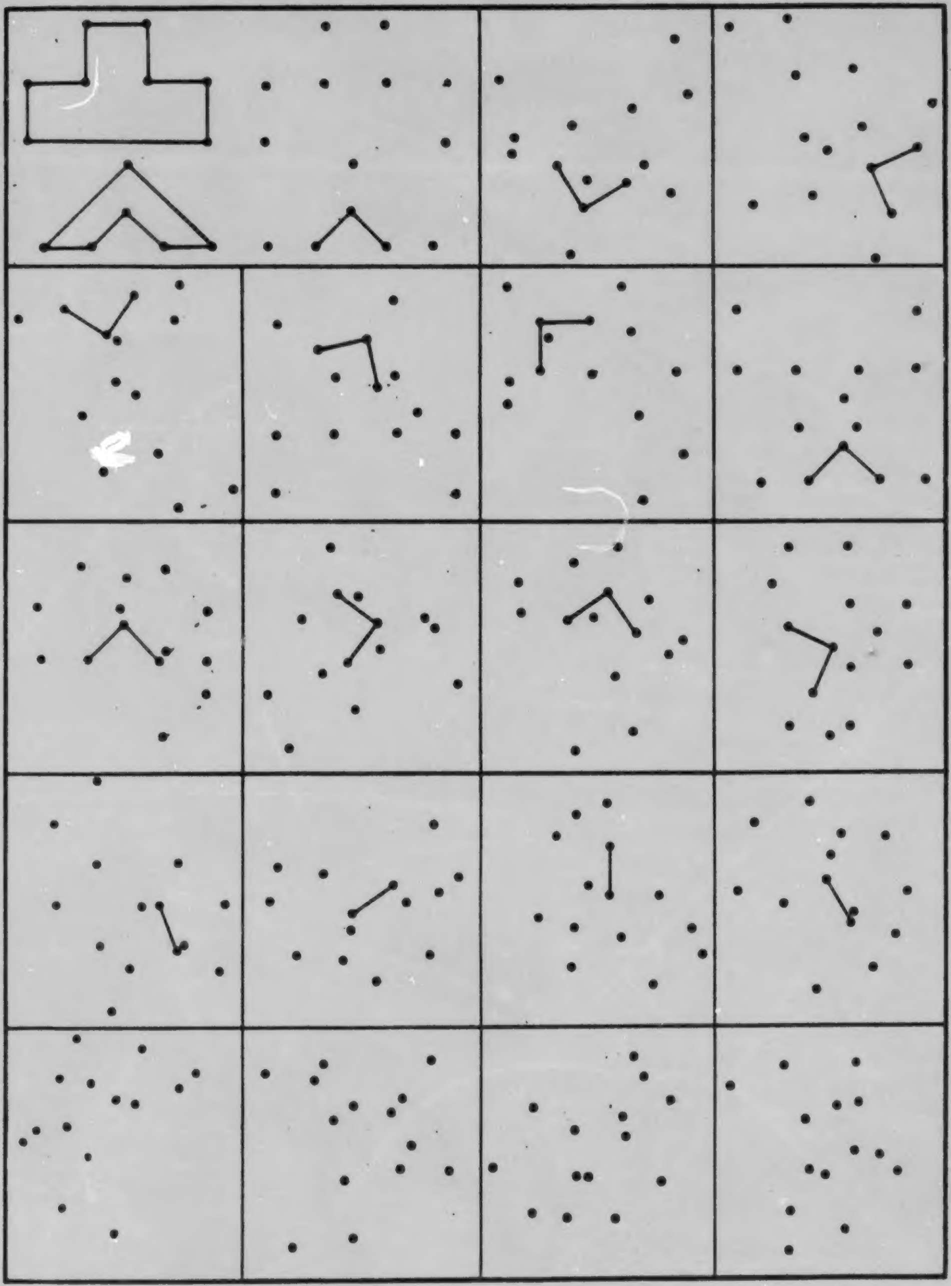

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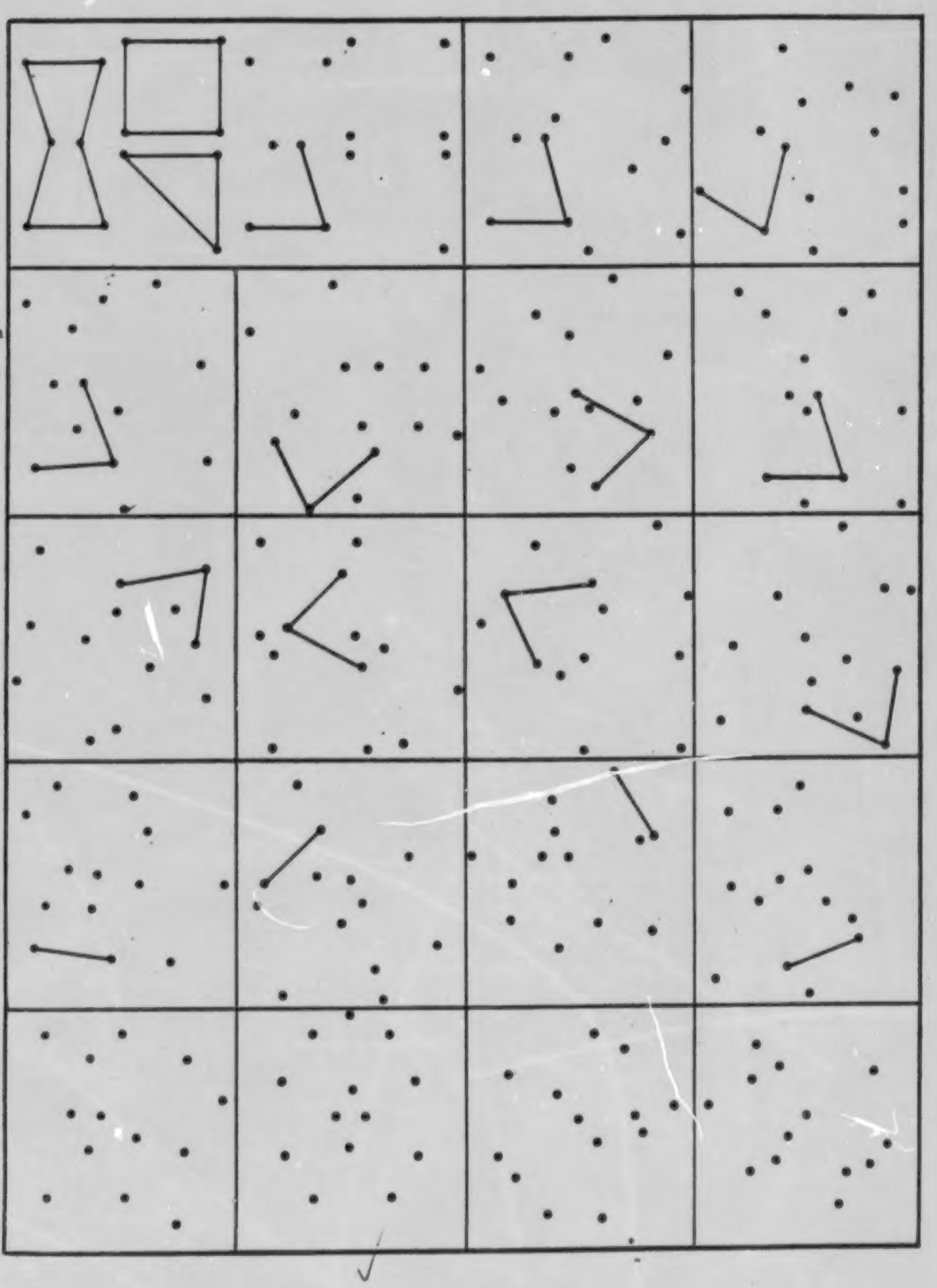

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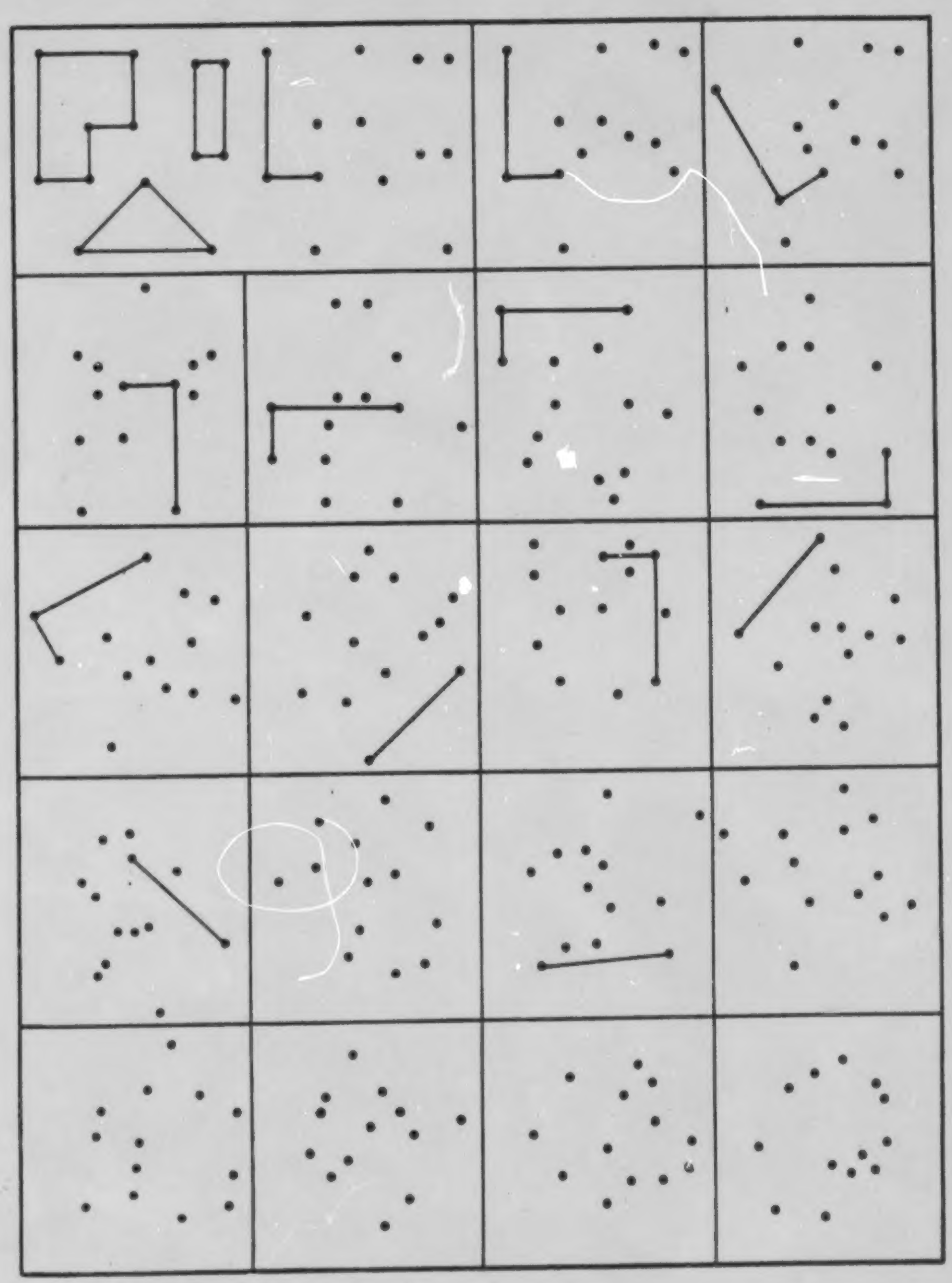

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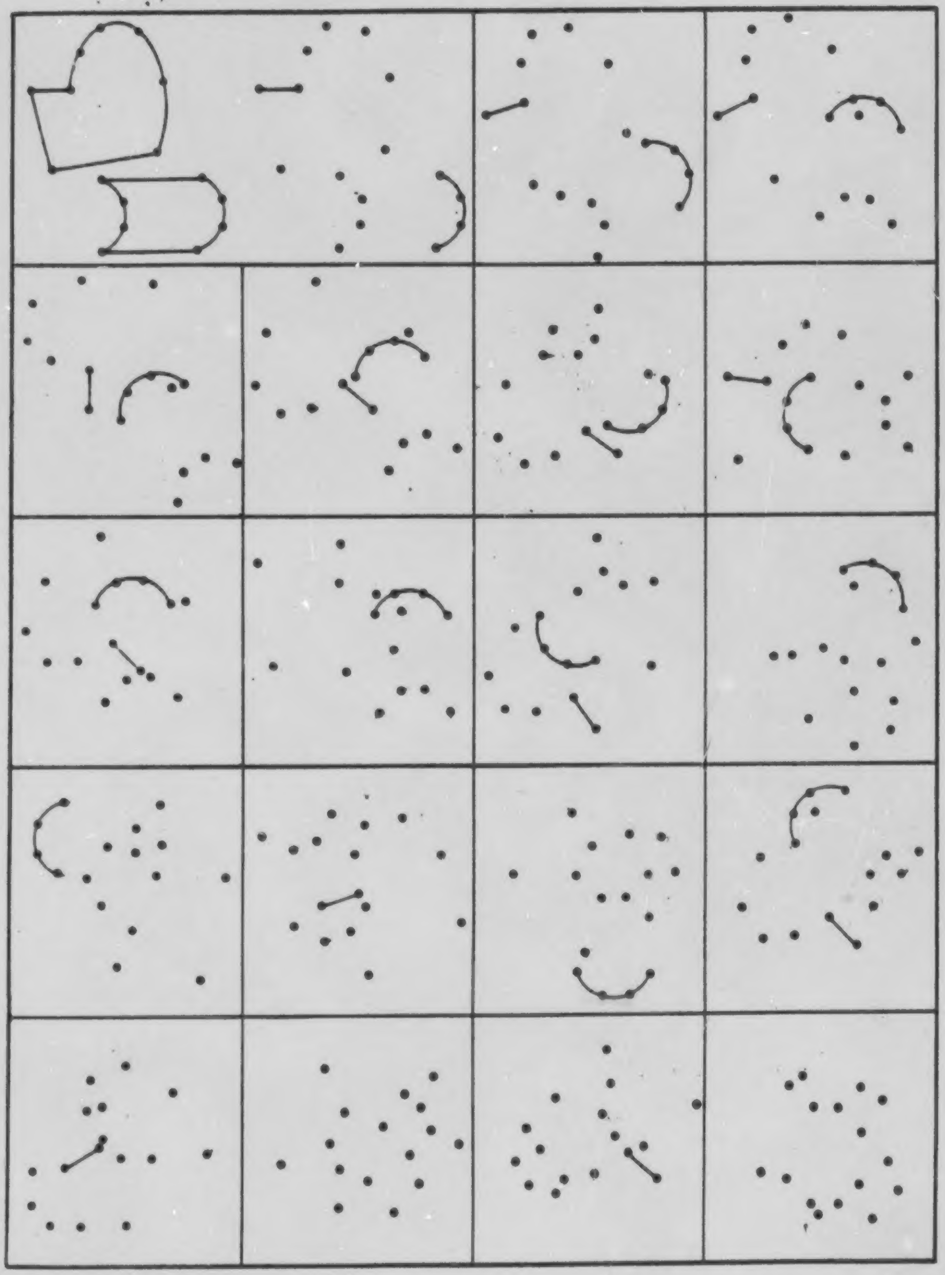

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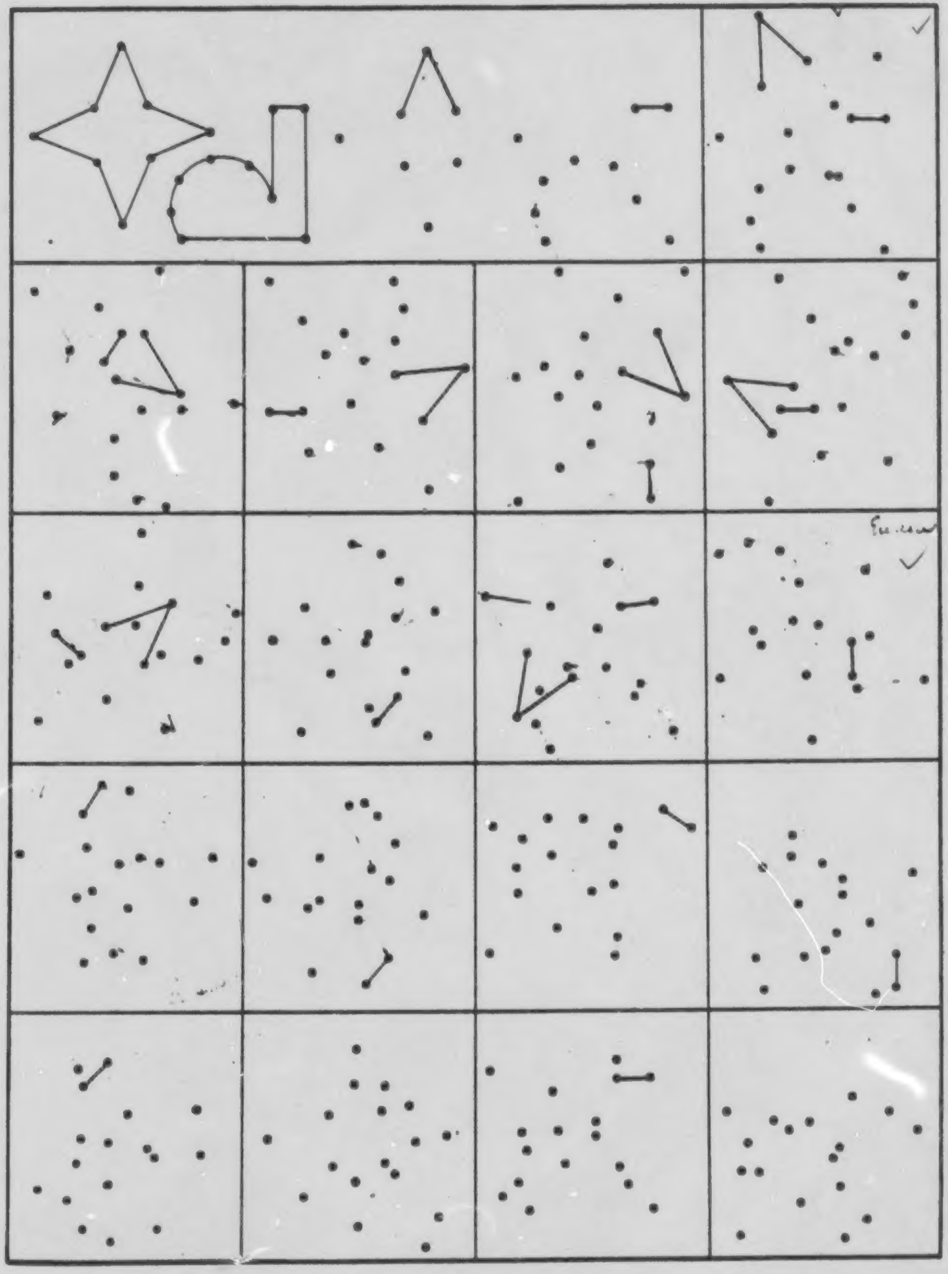
OD
8

Name ____________________



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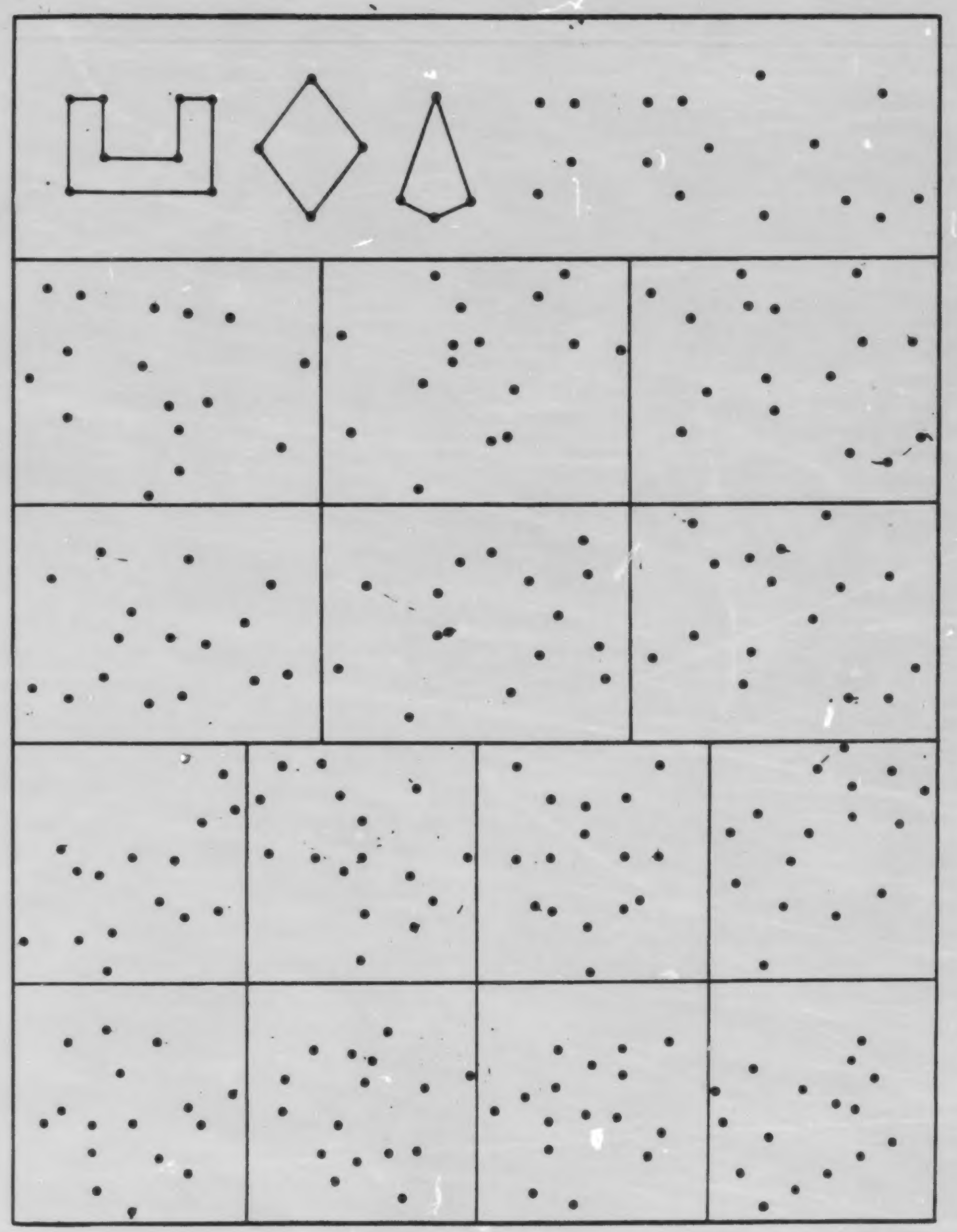
OD
9

Name ____________________



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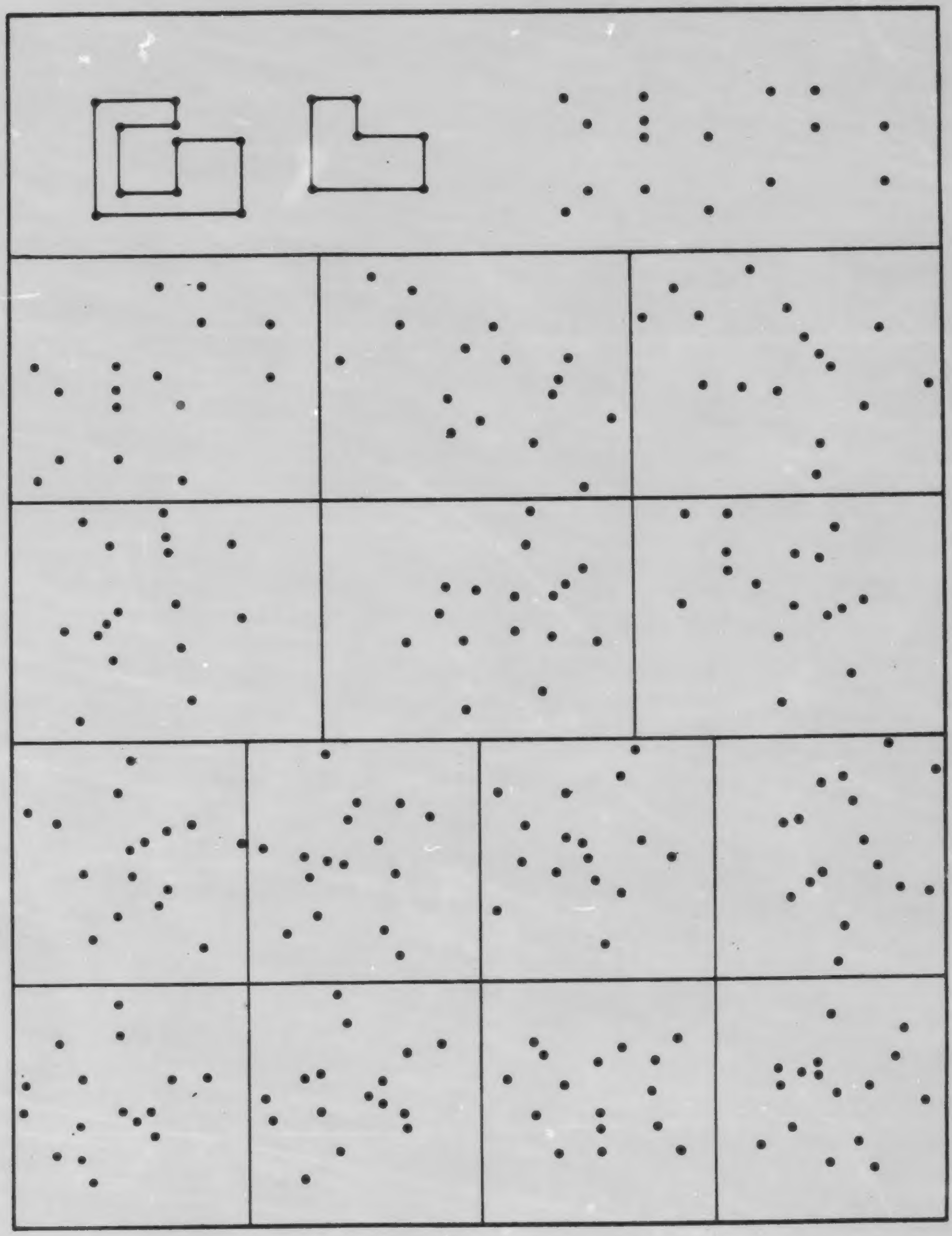

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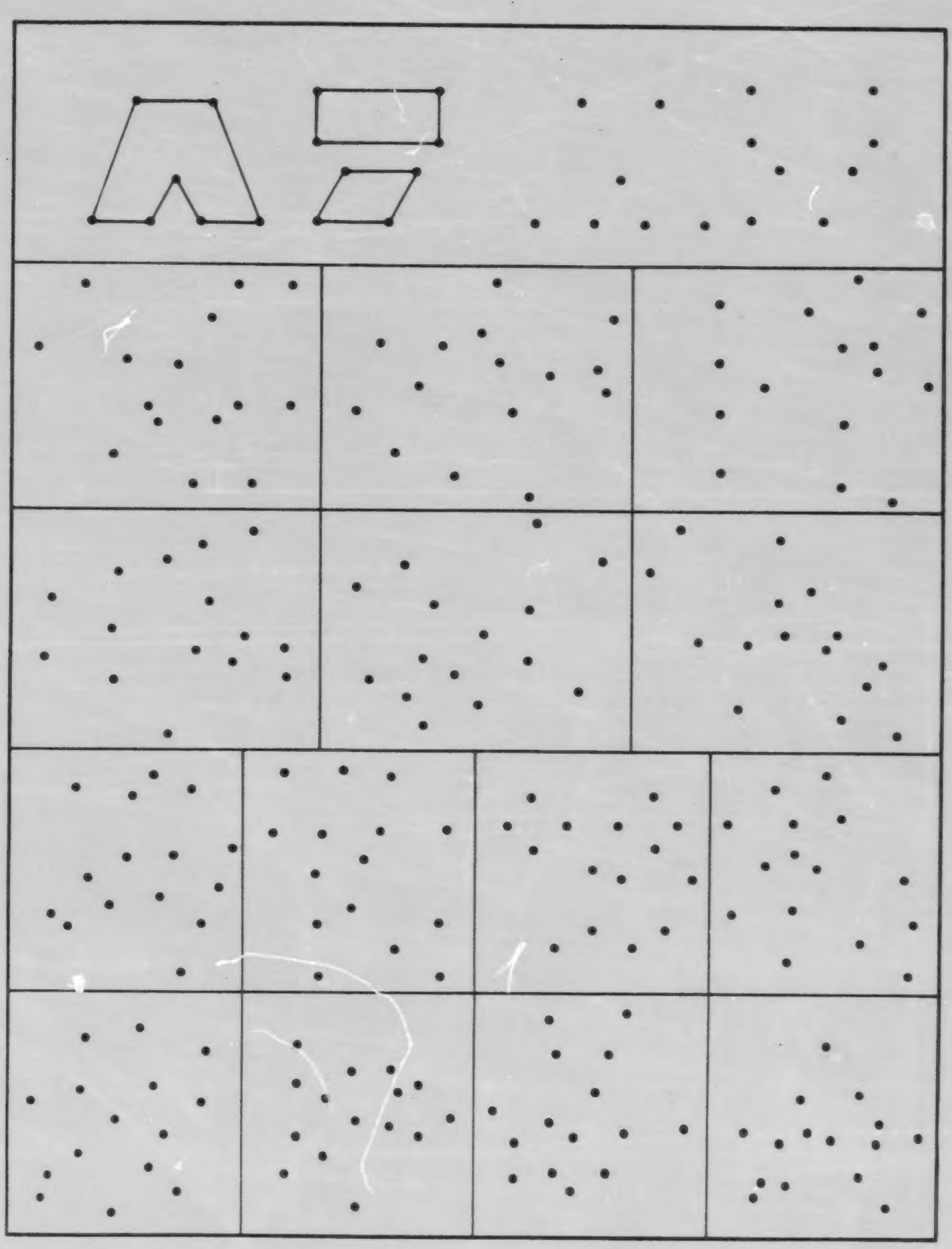
OD
11

Name ______________________________

12



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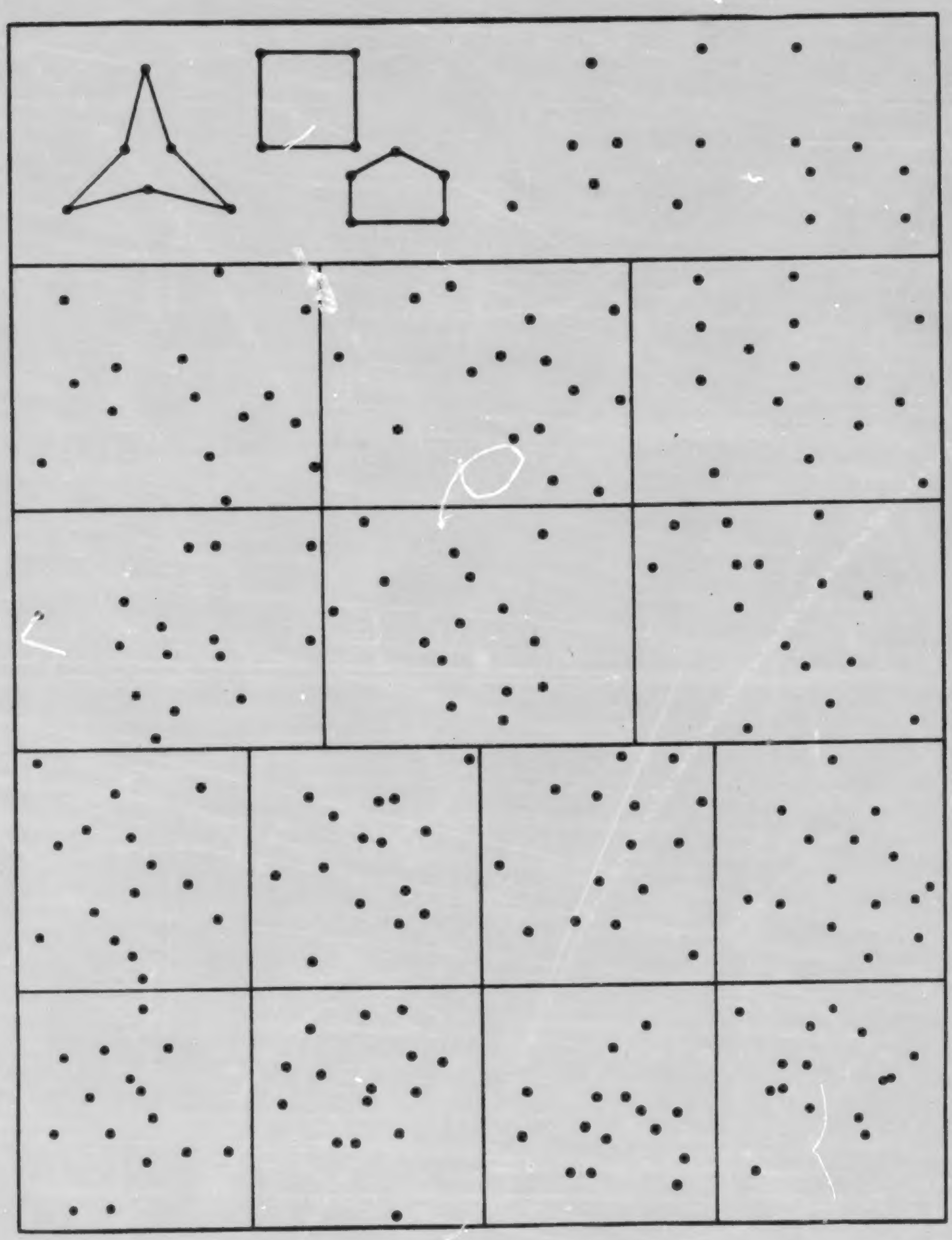
OD
12

Name ____



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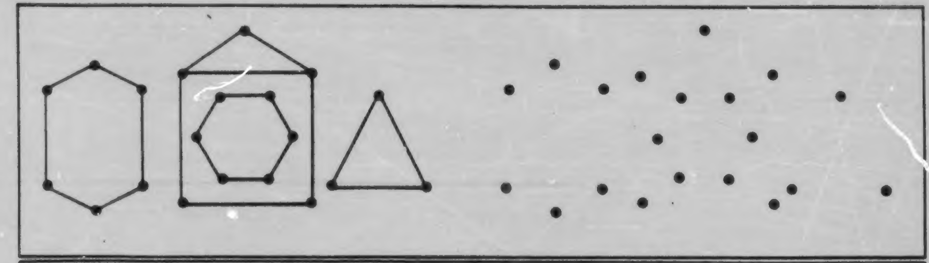

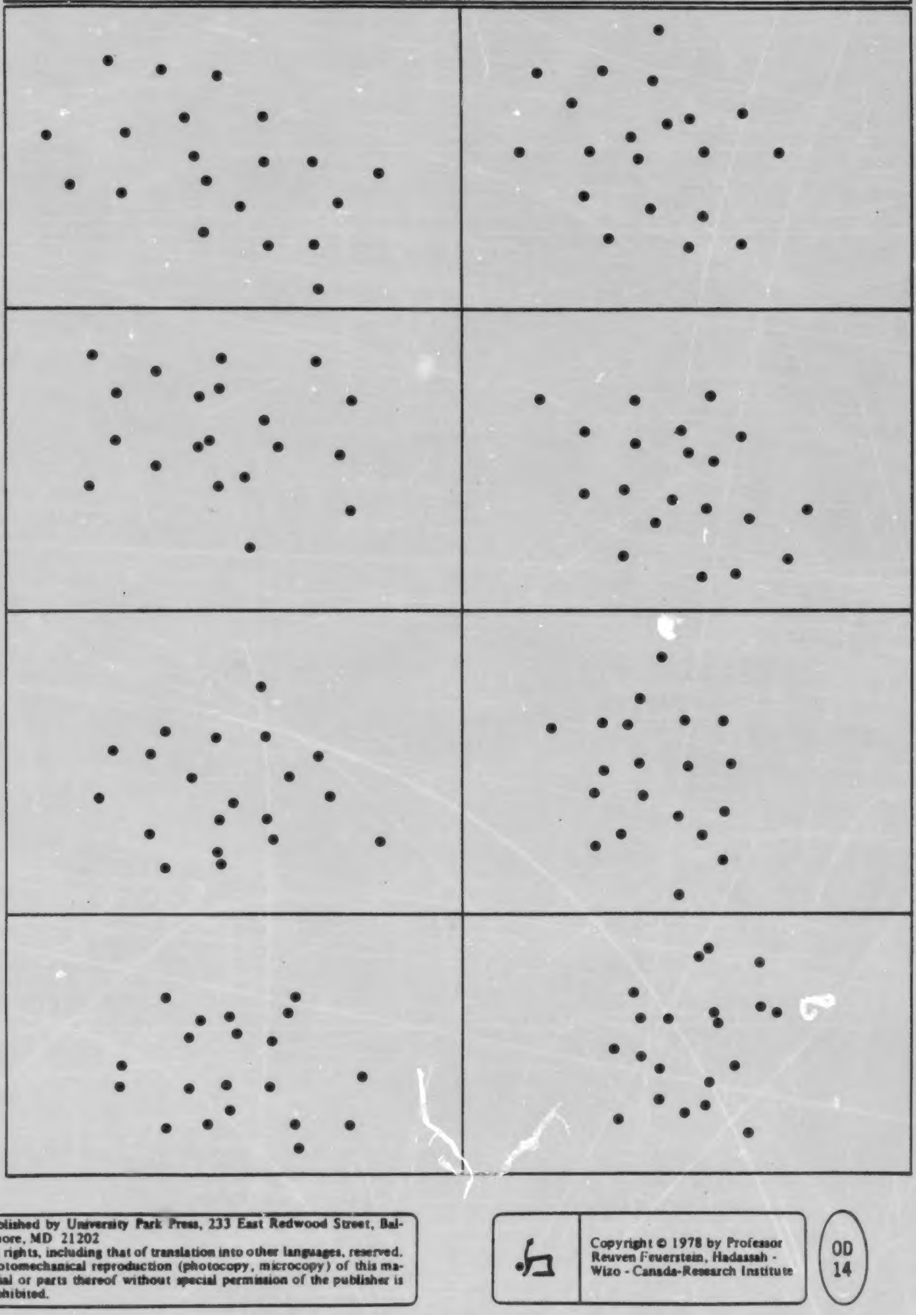

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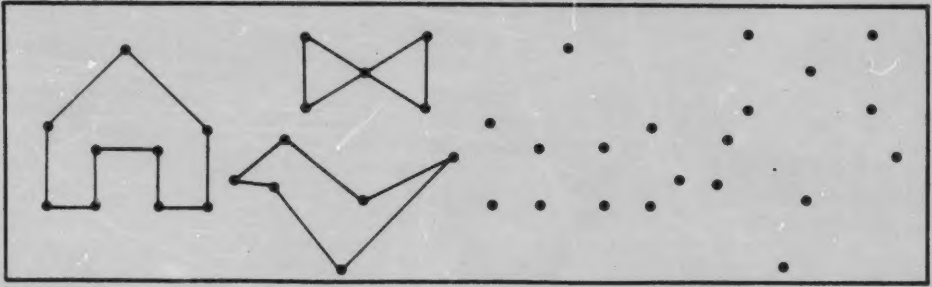

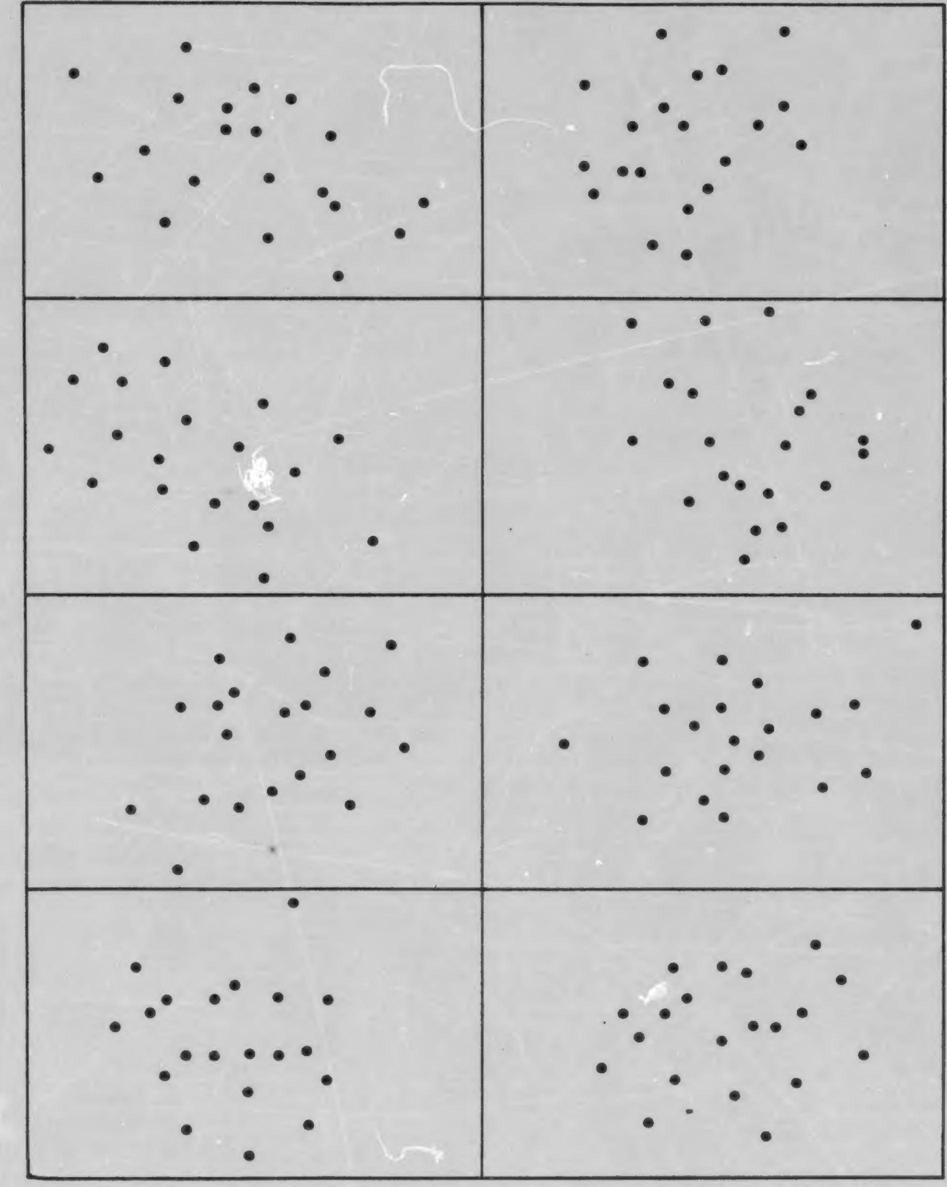

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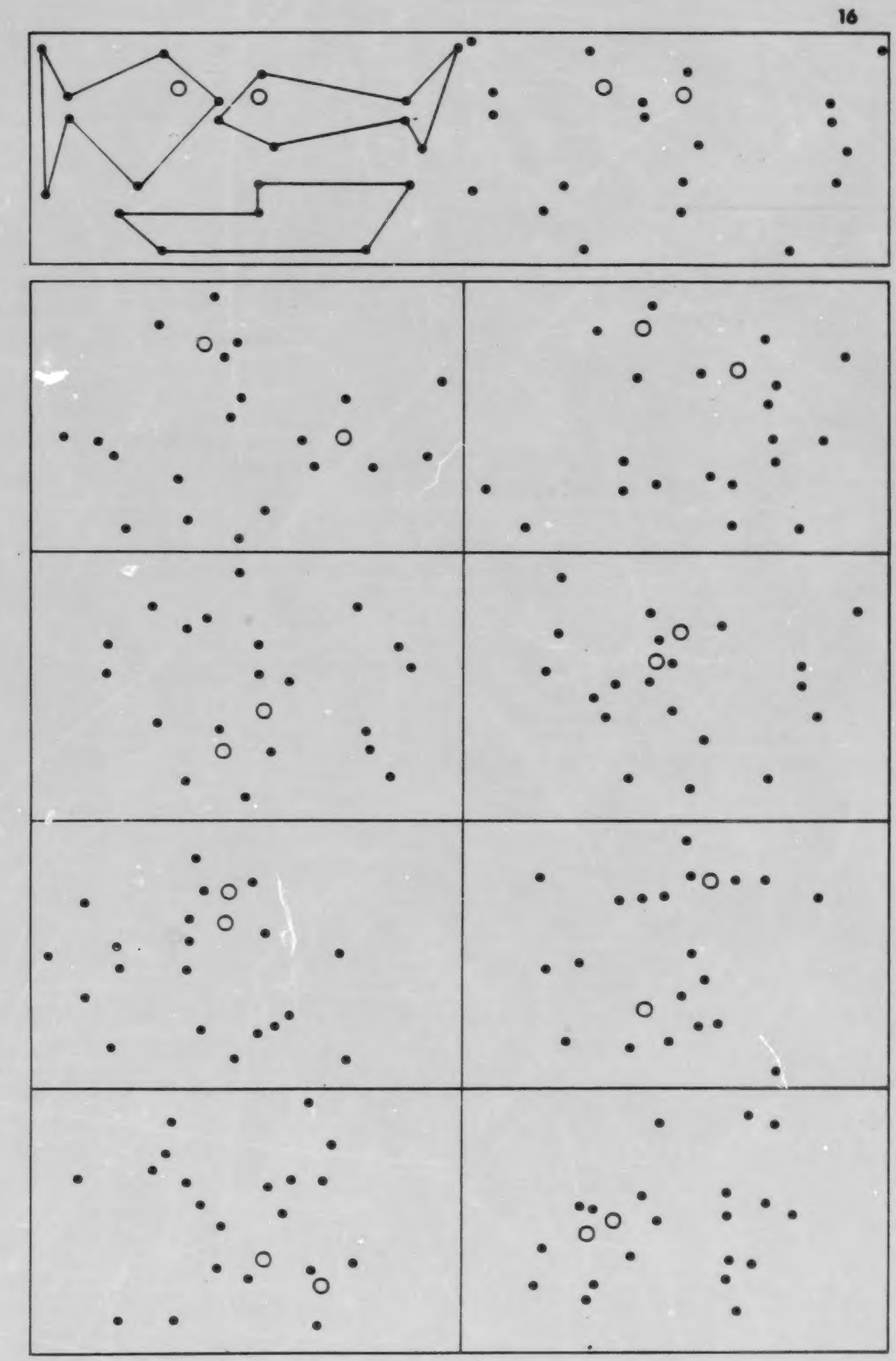
16



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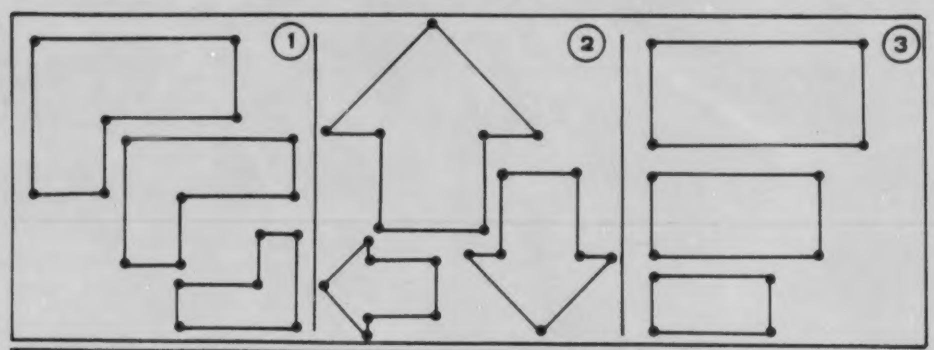
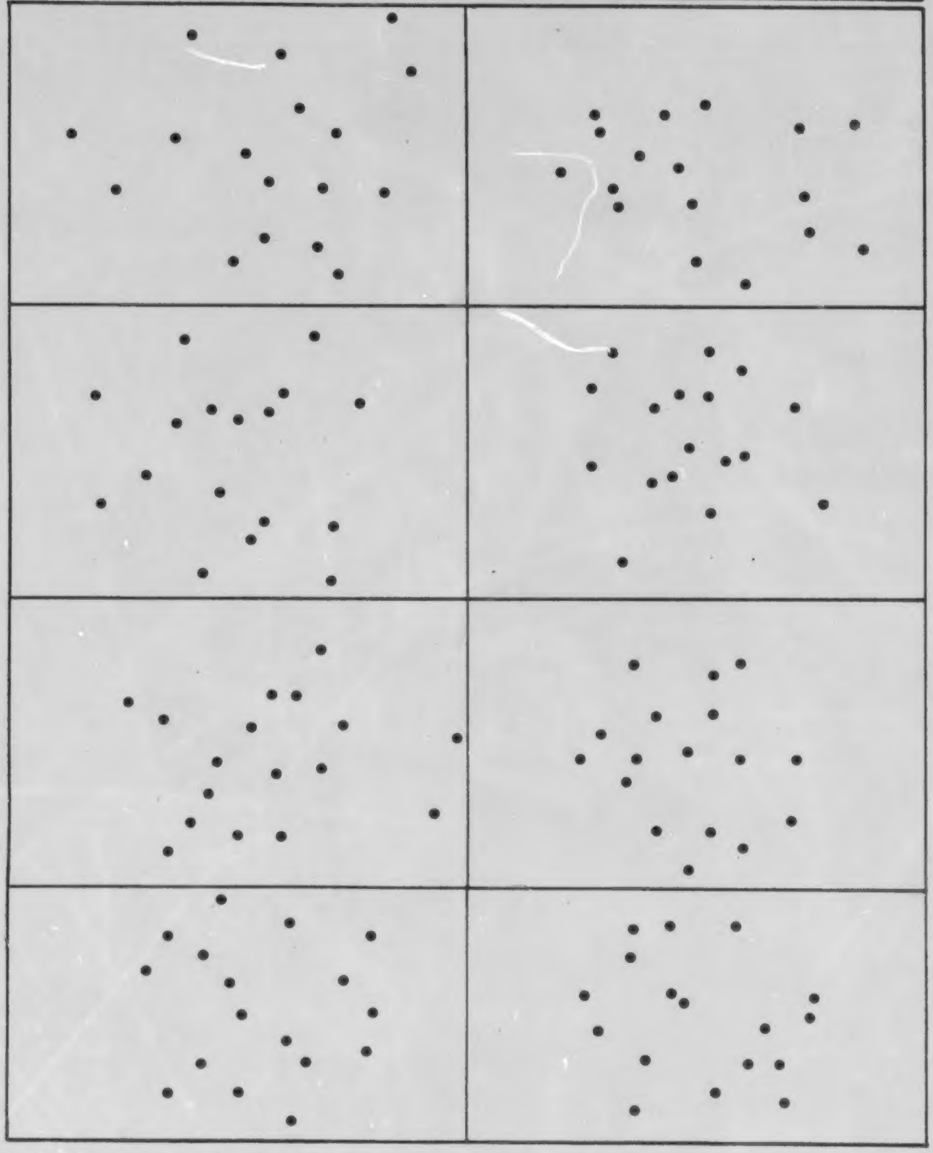
OD
16

Name ______________________________ 17





Each exercise contains one figure each from Set 1, Set 2, and Set 3. Choose the correct figures and organize the dots accordingly.

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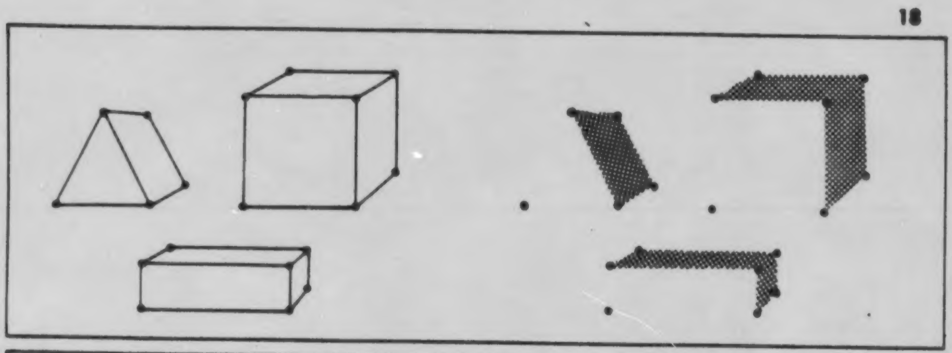
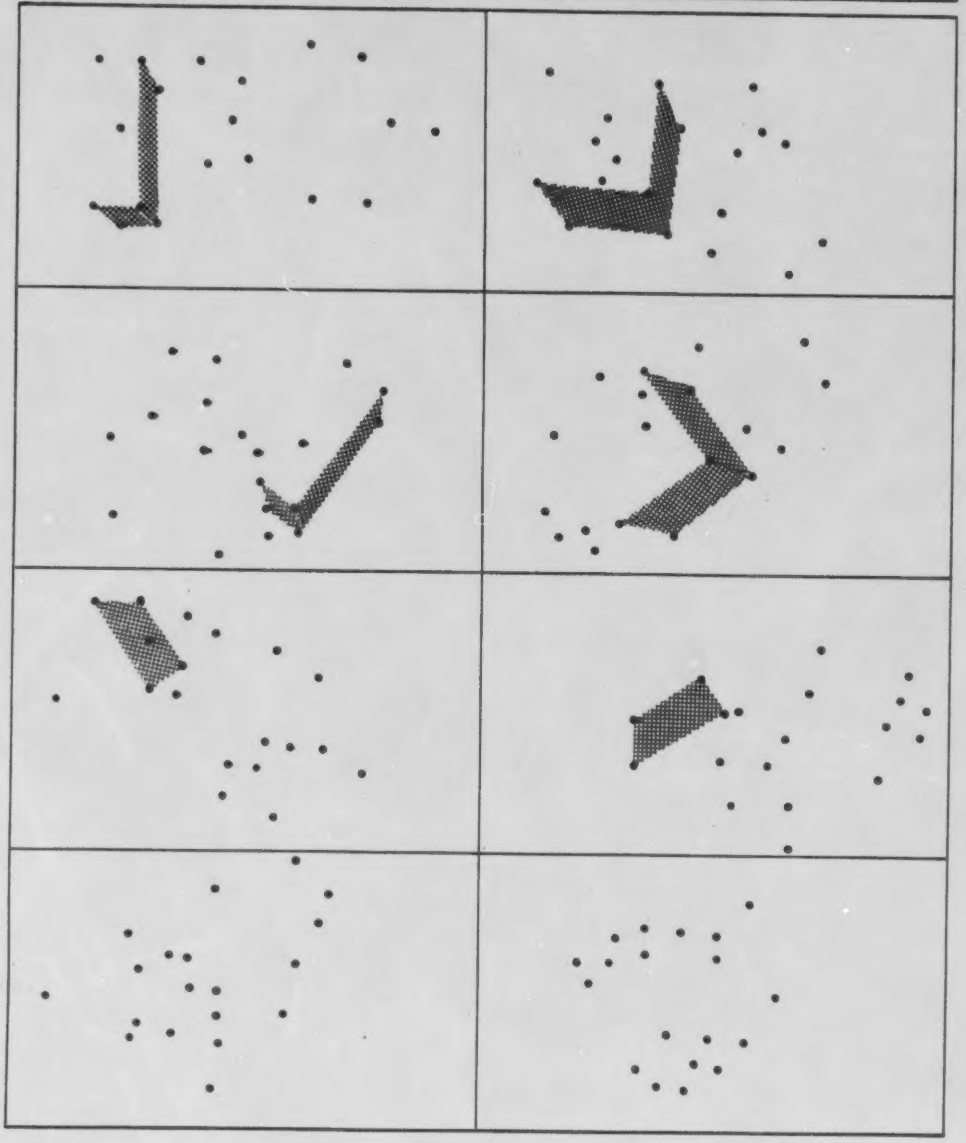
OD
17

Name ________________________________

18





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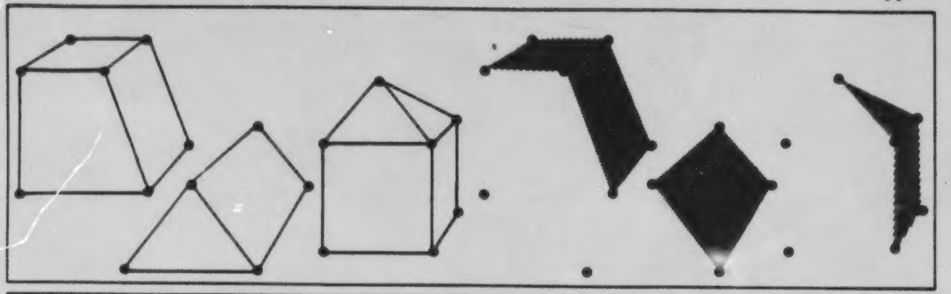
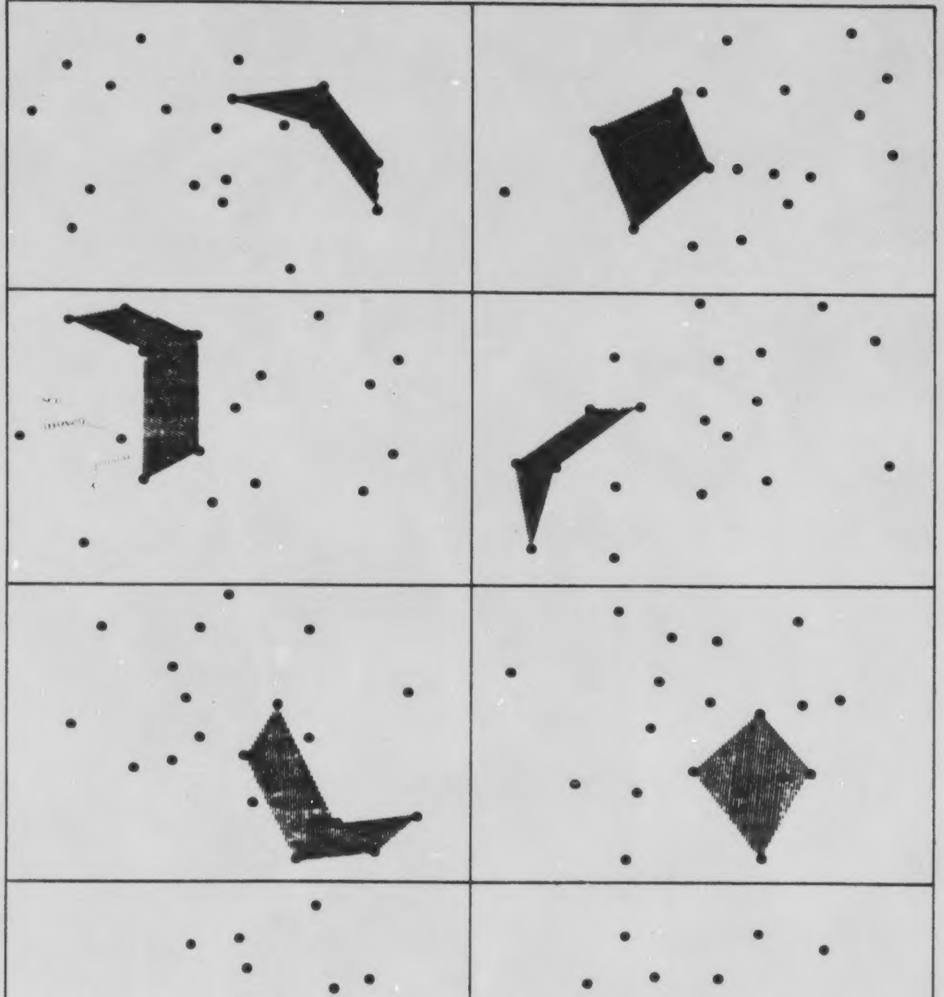
OD 18

Name ______________________________





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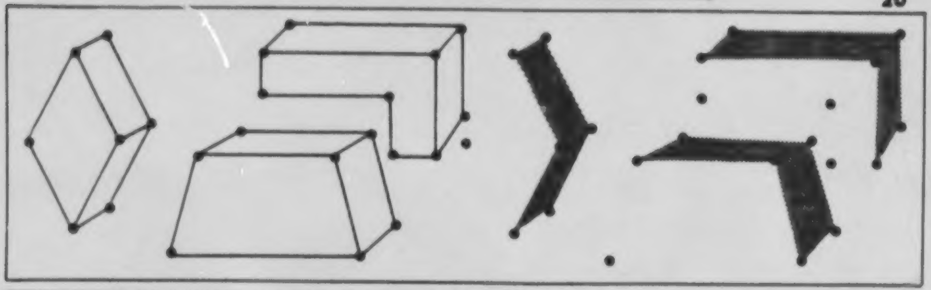

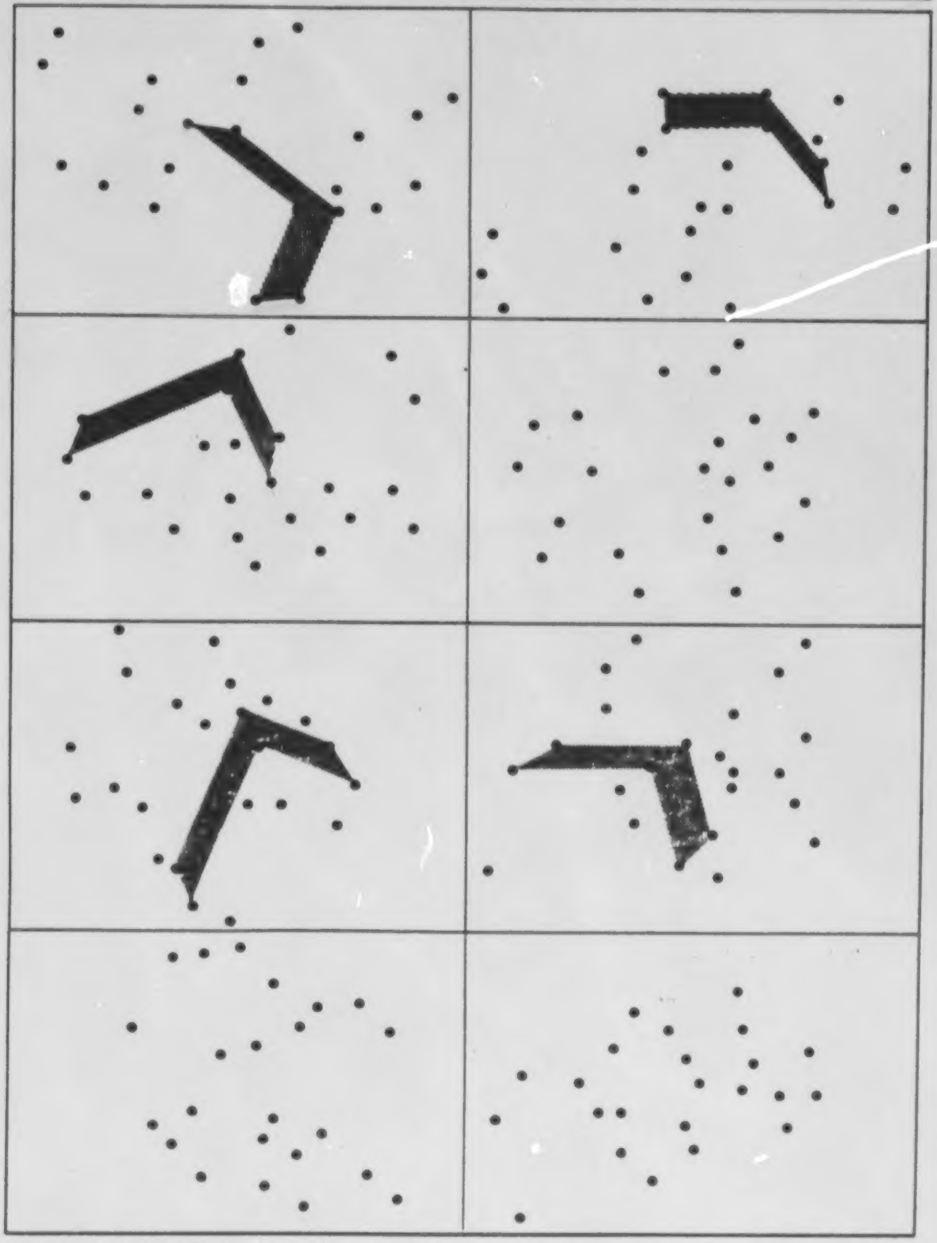

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OD
20

Name ____________________

FIND THE ERROR

b-1

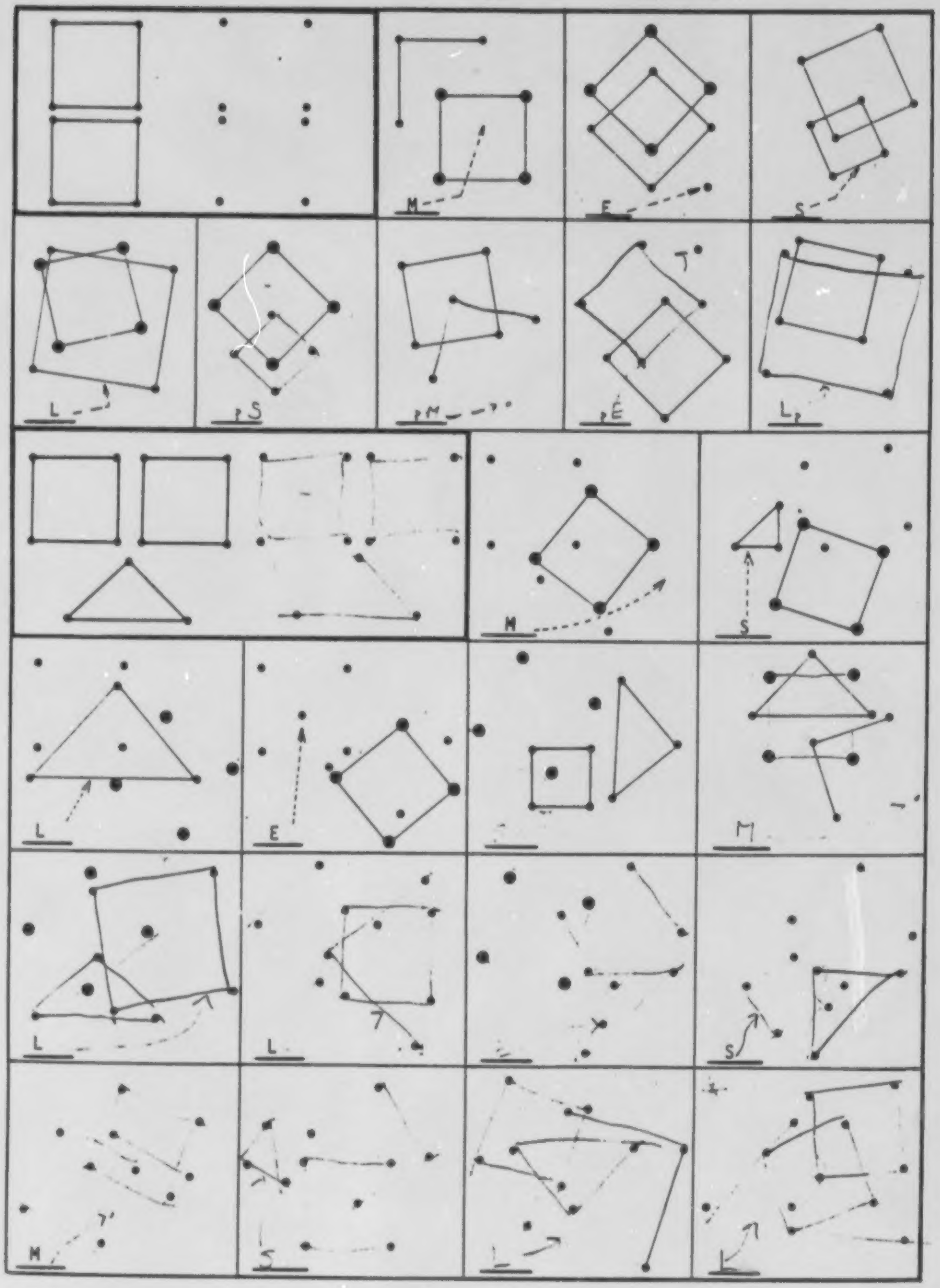
Describe the kind of error which appears in each frame according to the following key:

E = Extra Dot

M = Missing Dot

S = Smaller Figure

L = Larger Figure



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ODb
1

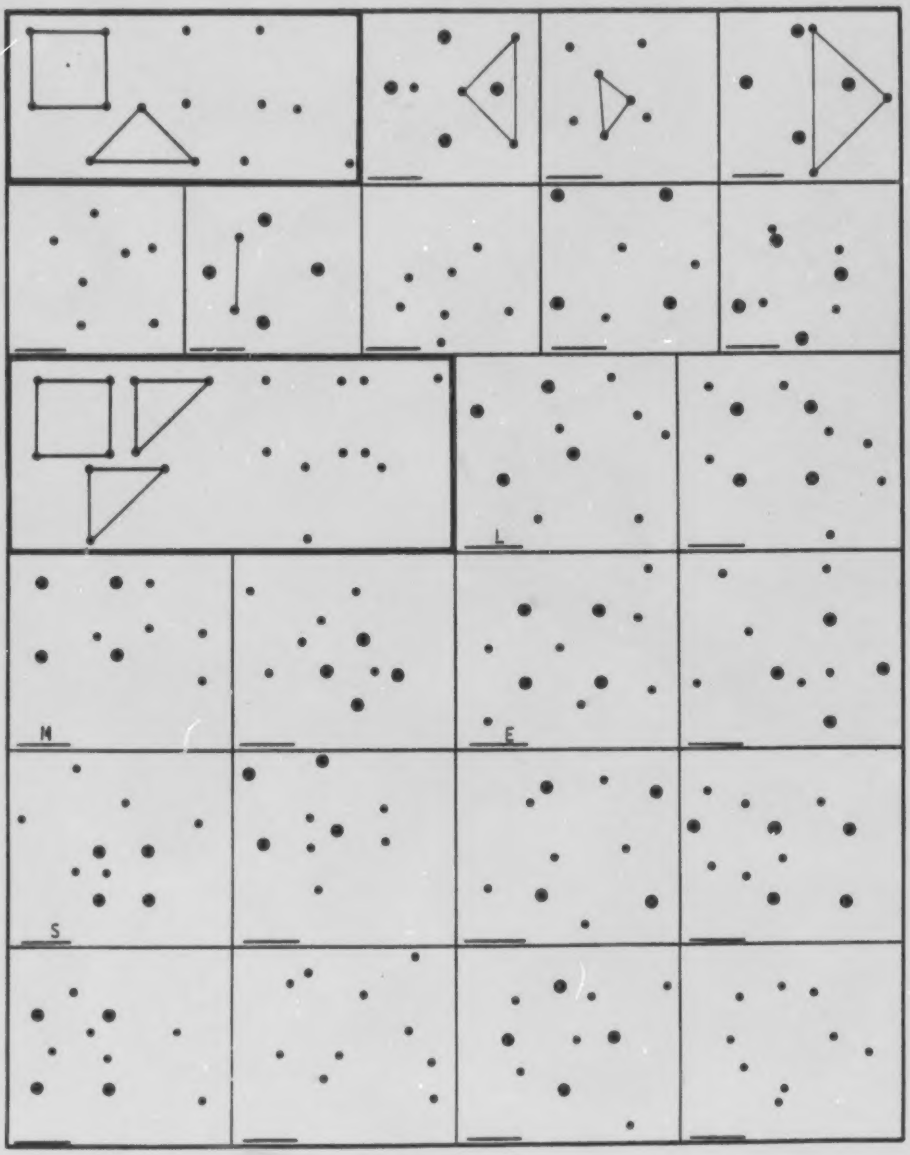
Name ____

b-2

FIND THE ERROR

Describe the kind of error which appears in each frame according to the following key:

E = Extra Dot
M = Missing Dot
S = Smaller Figure
L = Larger Figure



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ODb 2

Name ______________________________

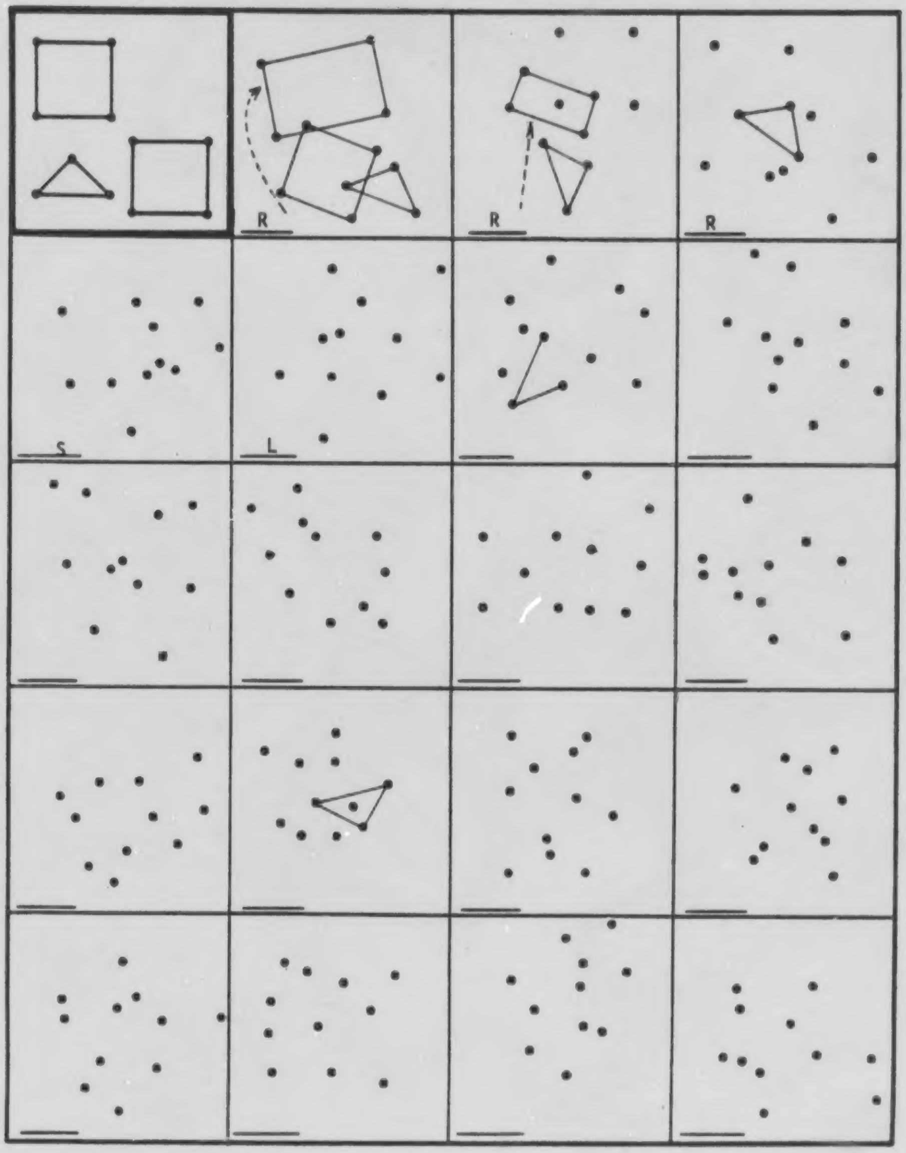
b-3

FIND THE ERROR

Describe the error you find in each frame according to the following key:

S = Smaller Figure L = Larger Figure

R = Rectangle



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ODb 3

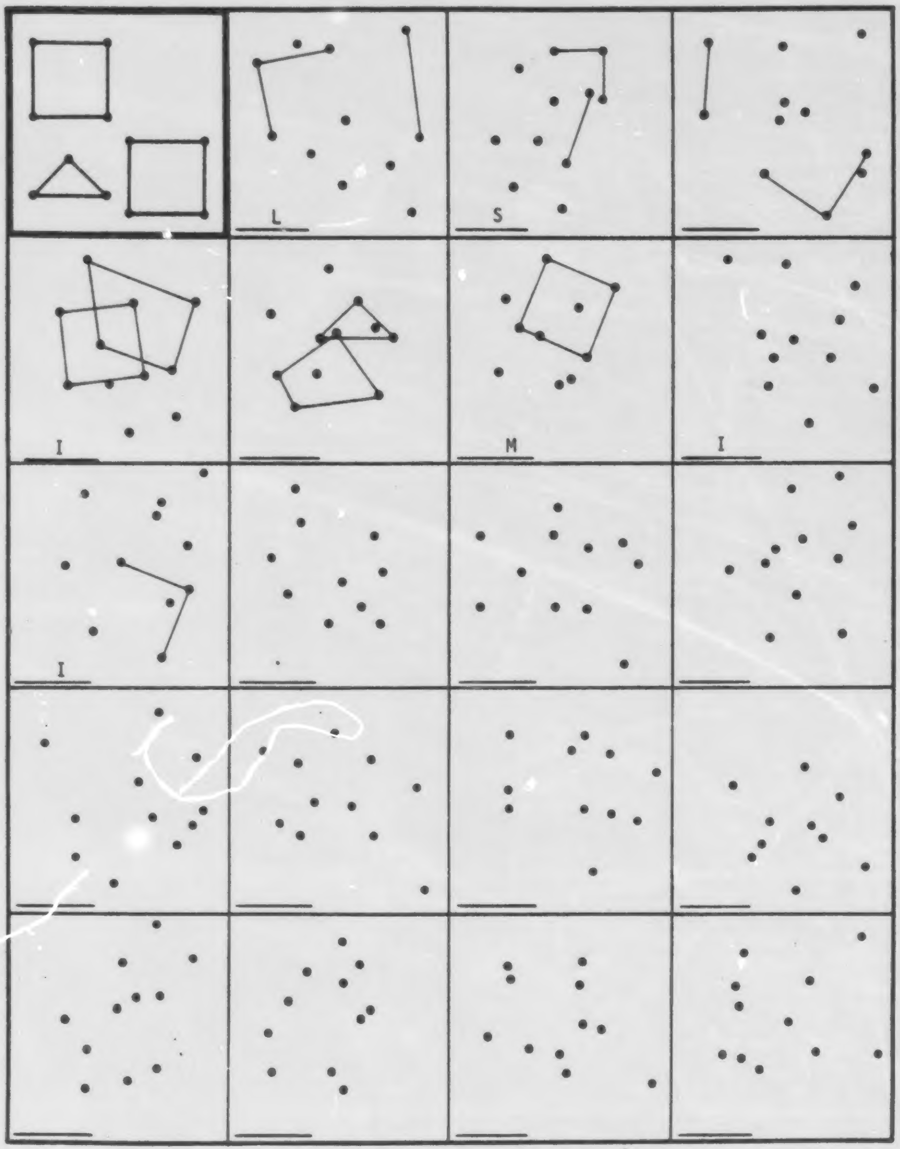
Name ____________________

b-4

FIND THE ERROR

Describe the kind of error which appears in each frame according to the following key:

S = Smaller Figure
L = Larger Figure
M = Missing Dot
I = Incorrect Form



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ODb
4

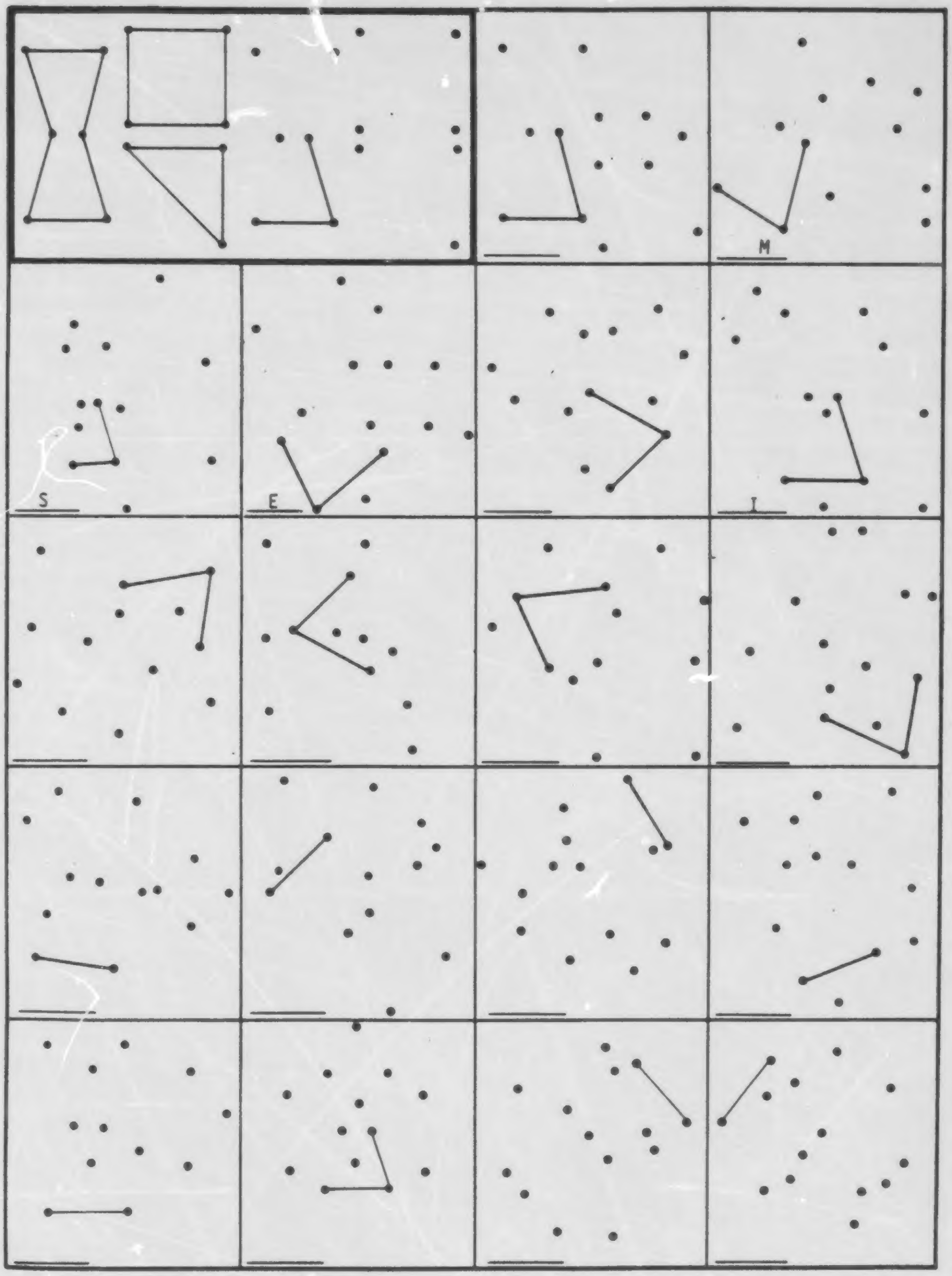
Name ____

FIND THE ERROR

b-5

Describe the kind of error you find in each frame according to the following key:

I = Incorrect Form
M = Missing Dot
S = Smaller Figure
E = Extra Dot



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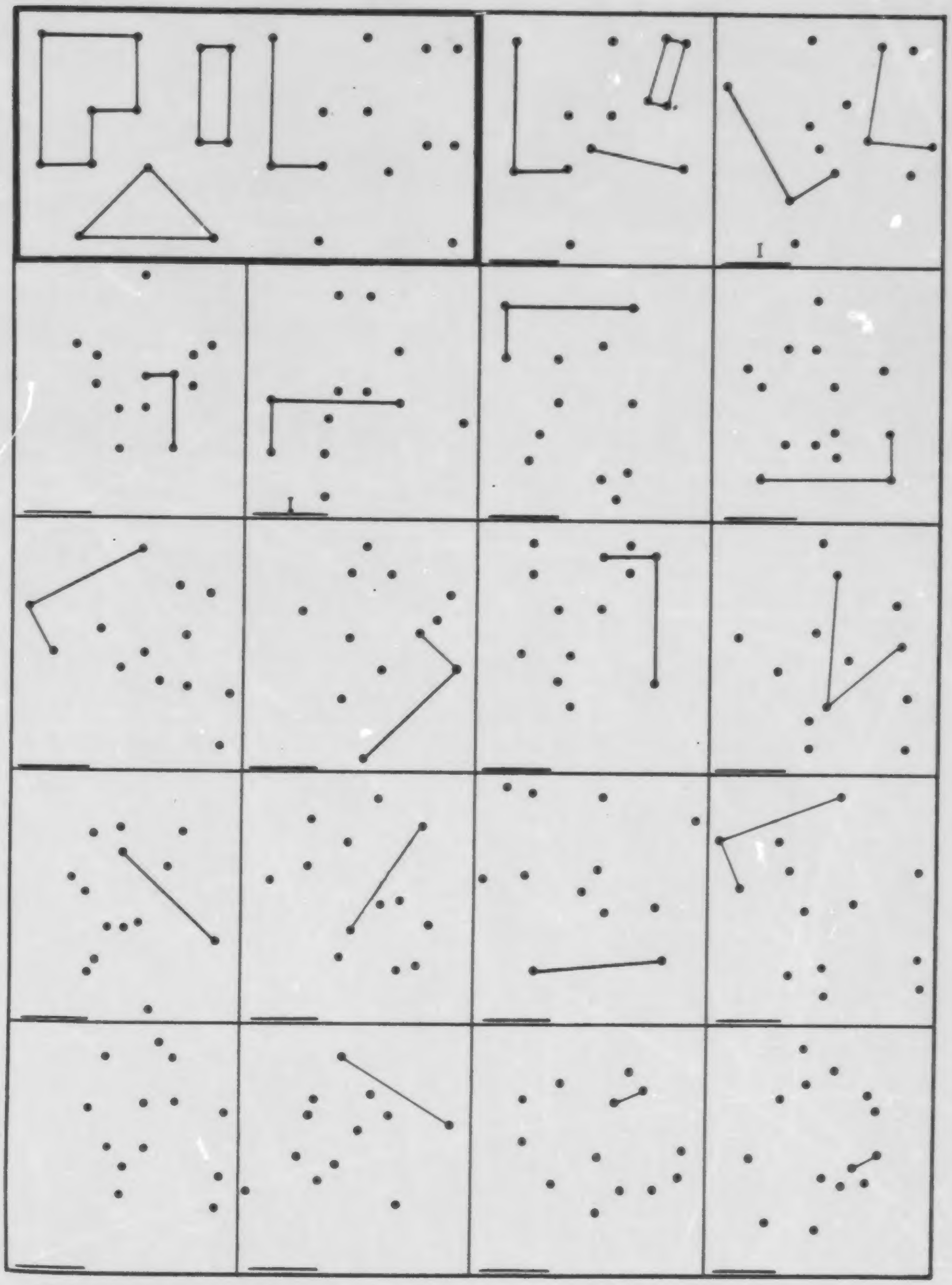
ODb 5

Name ____

FIND THE ERROR

Describe the kind of error you find in each frame according to the following key:

I = Incorrect Form
S = Smaller Figure
M = Missing Dot
E = Extra Dot



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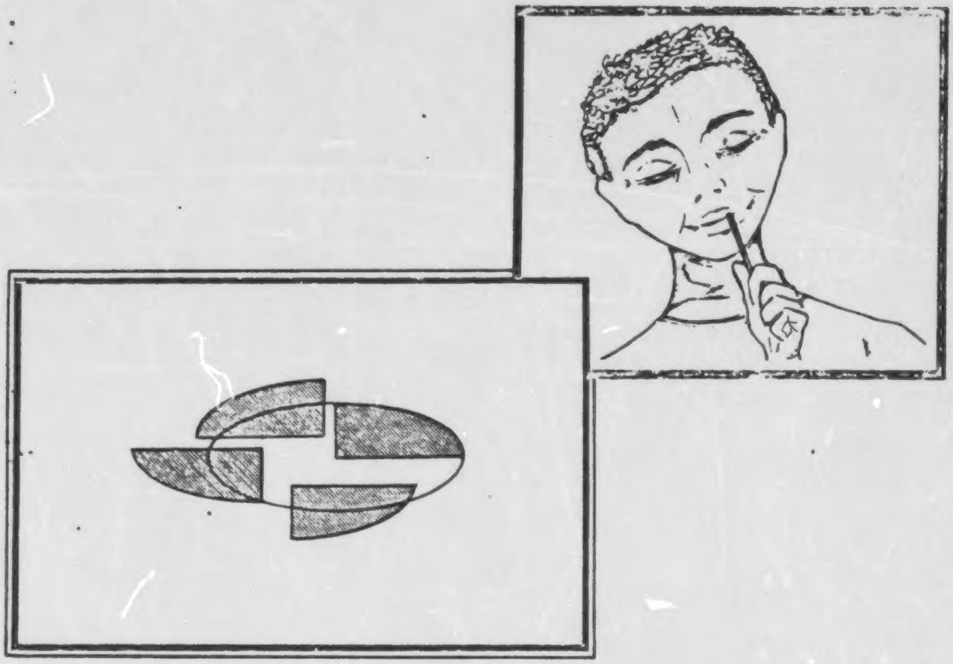
ODb
6

Name ____



JUST A MINUTE ...
LET ME THINK!

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Name ______________________________

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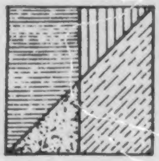	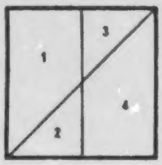

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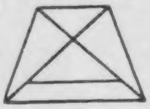

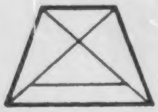

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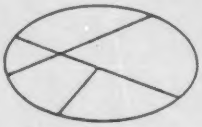

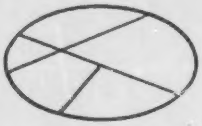

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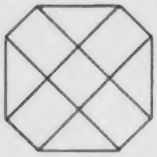

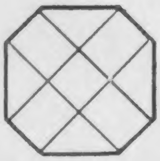

Into how many sections has the whole been divided? ____________

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AP
1

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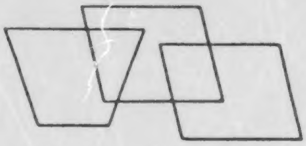	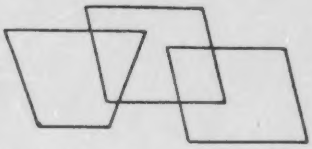
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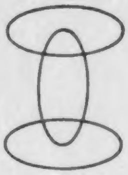	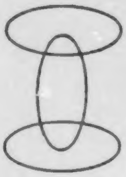
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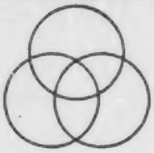	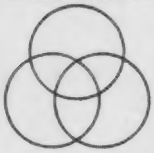
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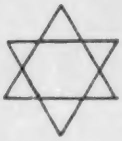	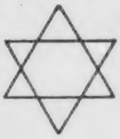
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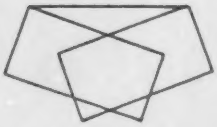	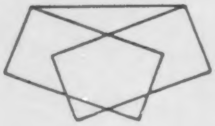
Into how many sections has the whole been divided? ____________	

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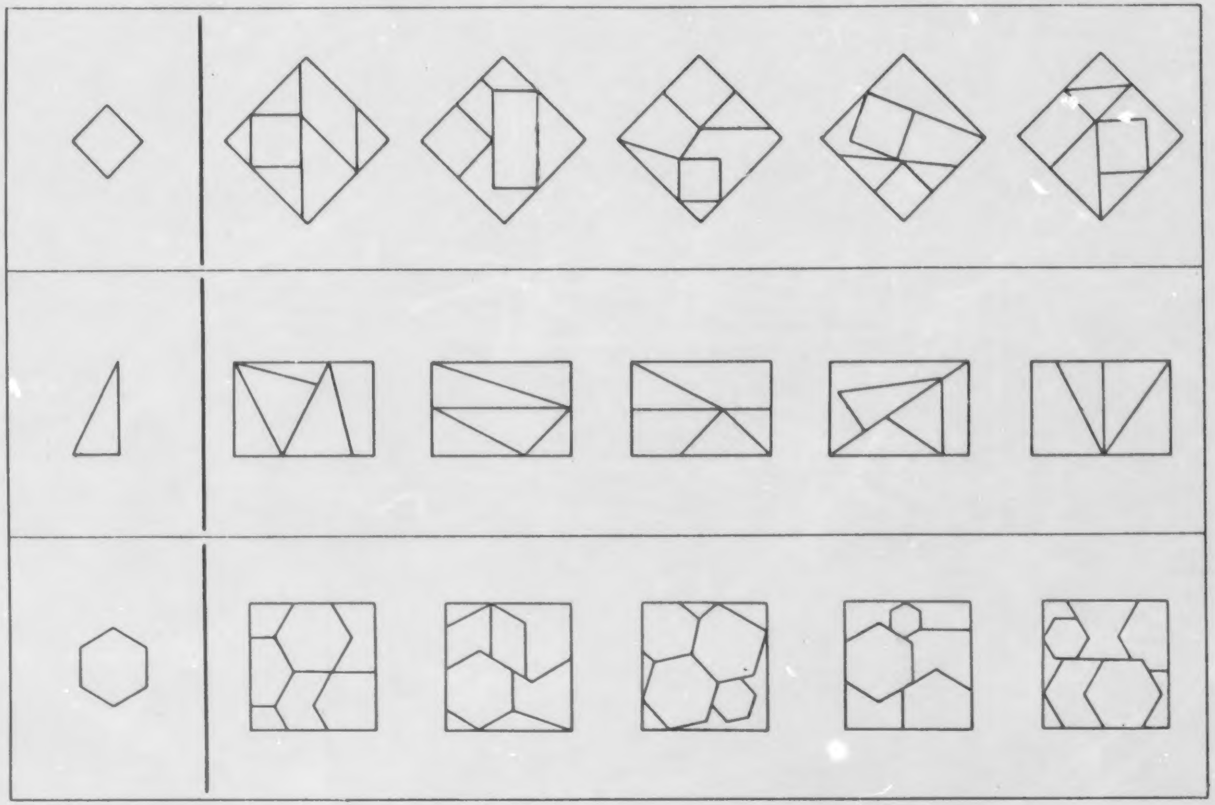
Name ____

At the left of each row is a part that is hidden in each of the complete designs in that row. Locate the part in each design and color it. Note: In the design, the part may appear in an orientation different from that of the model.



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AP
3

Name ____

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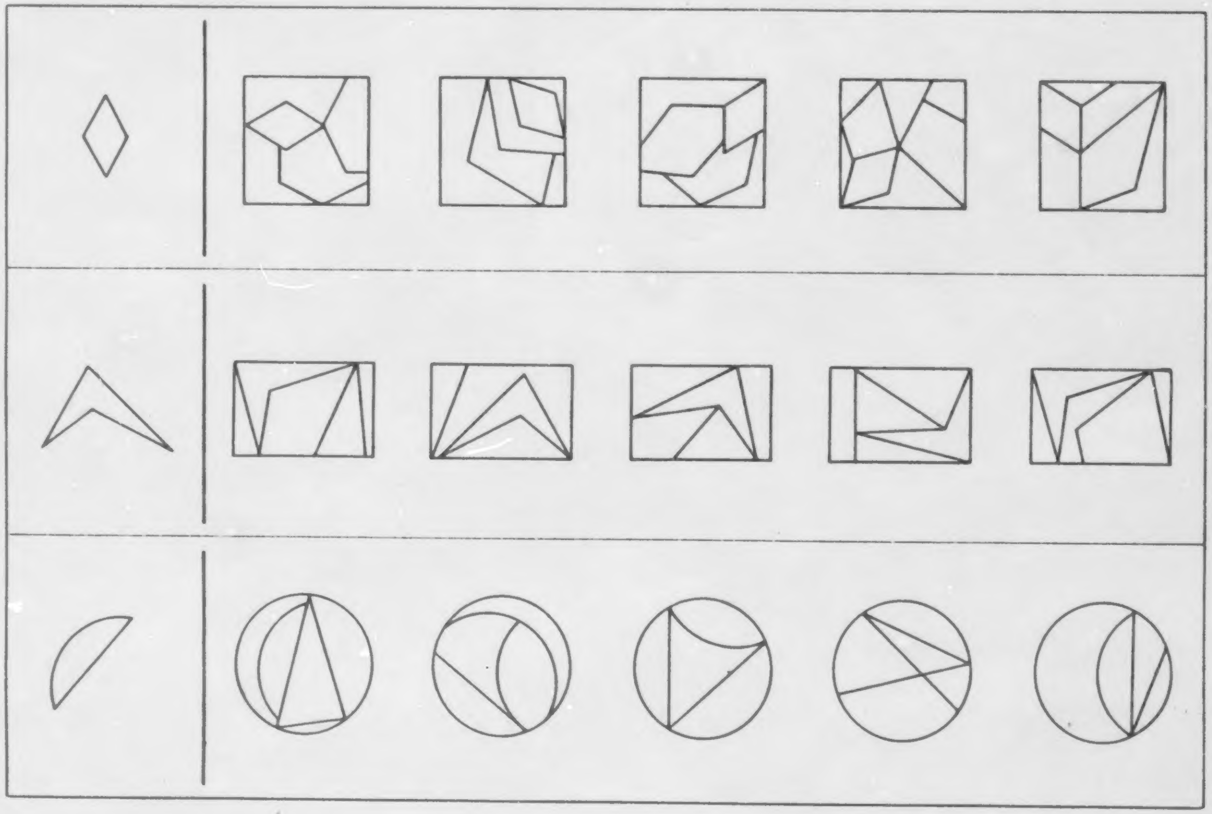

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Name ______________________________

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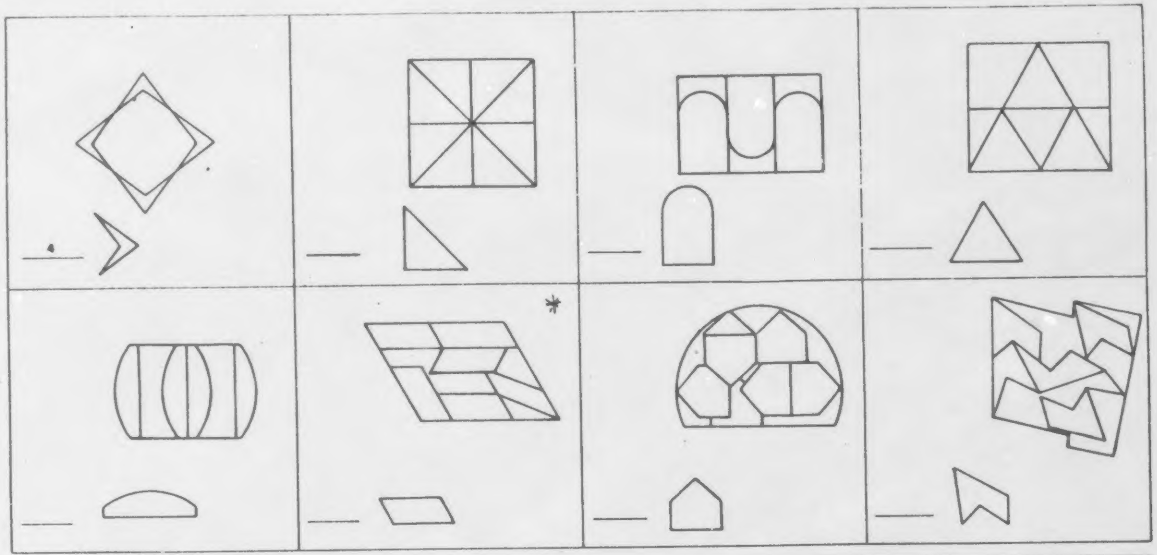

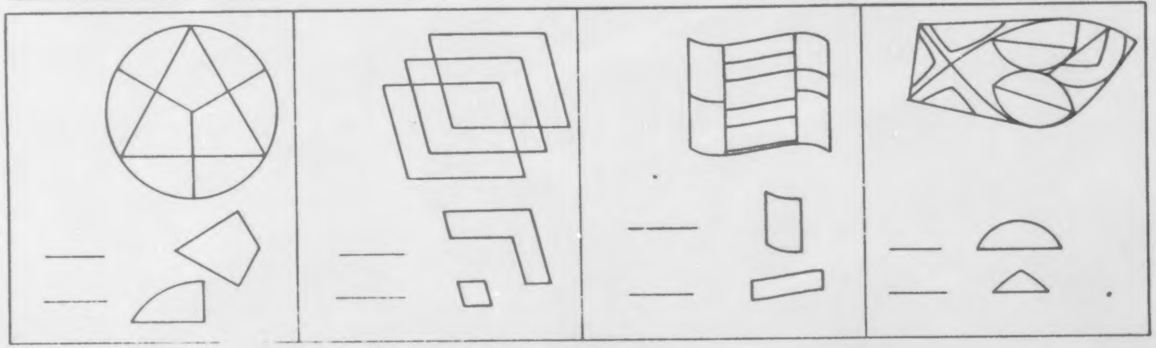

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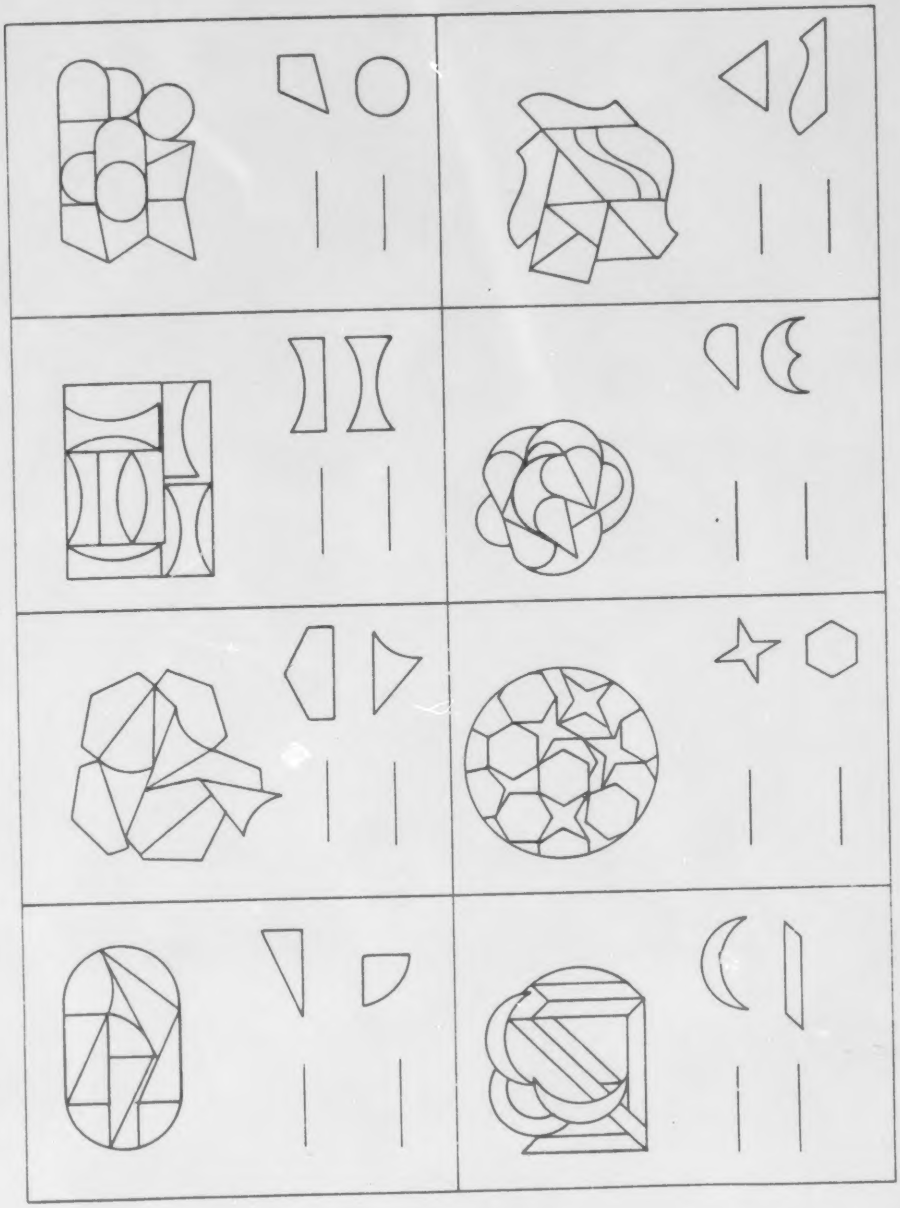

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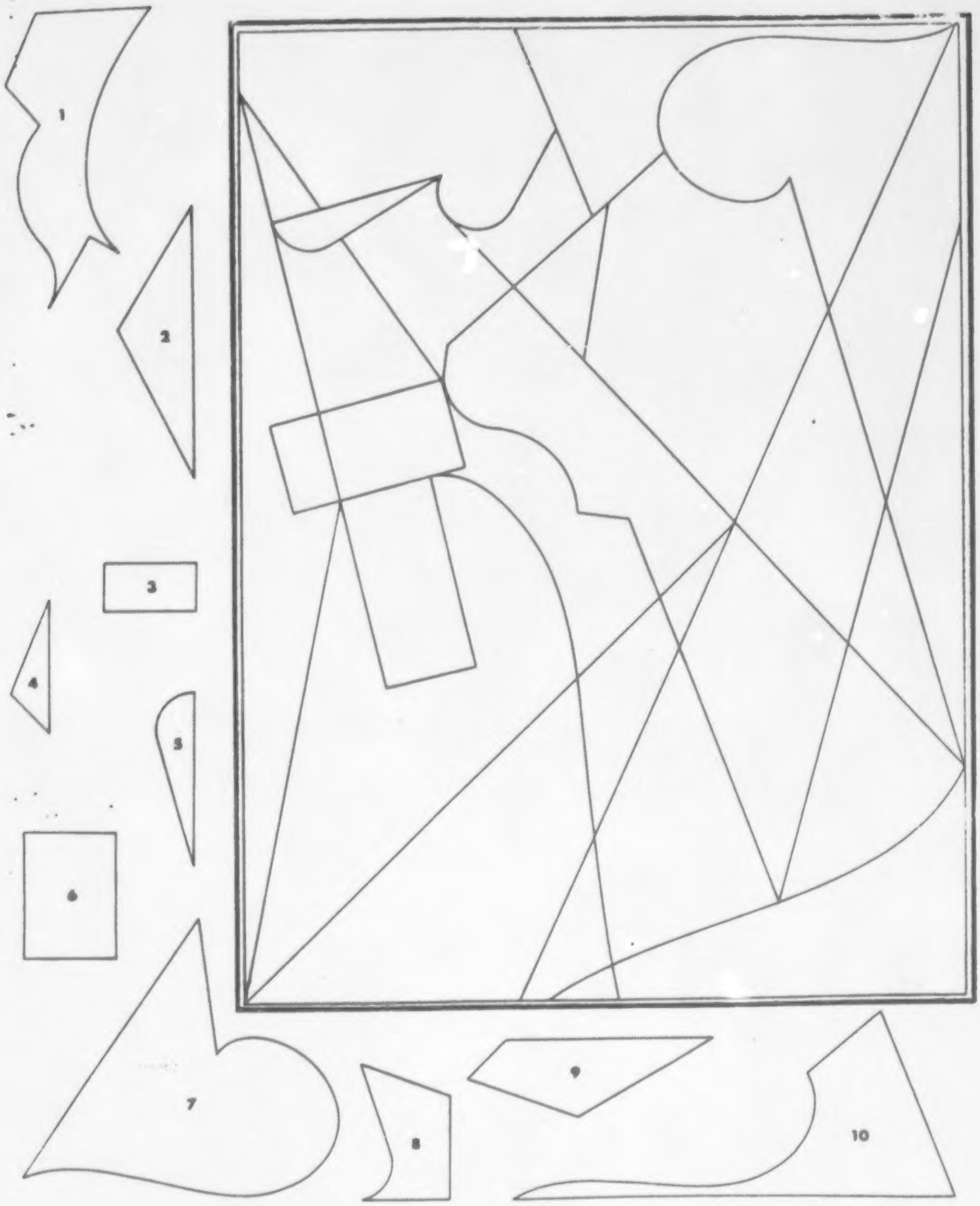
Name ______________________________

The numbered sections are hidden in the design which appears within the frame. Find each section, number it appropriately, and darken its outline.



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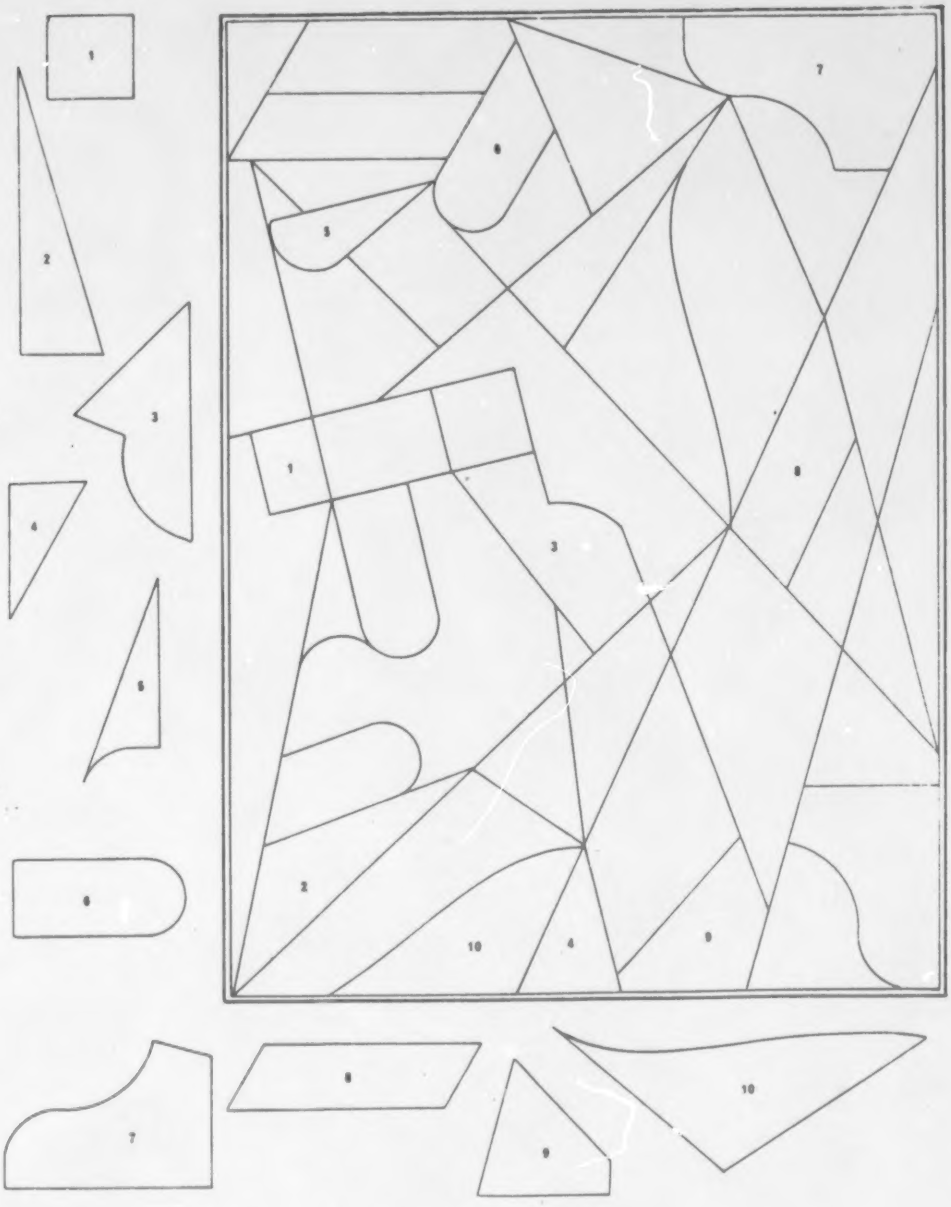
Name ______________________________

8

Correct the errors.

The numbered parts which appear outside of the frame are hidden within the design. After you find them, see that they are numbered correctly. Cross out those numbers which are incorrectly printed on the sections within the design.



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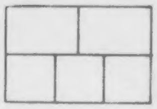
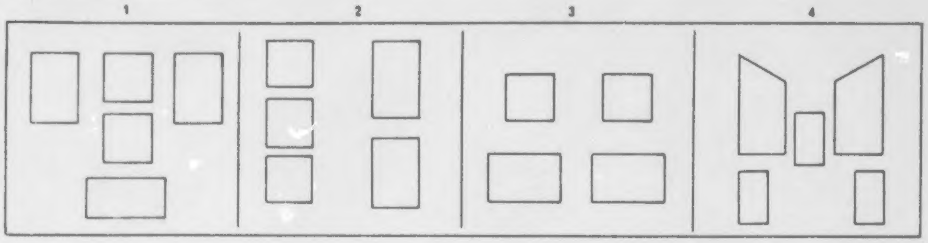
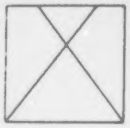
AP
8

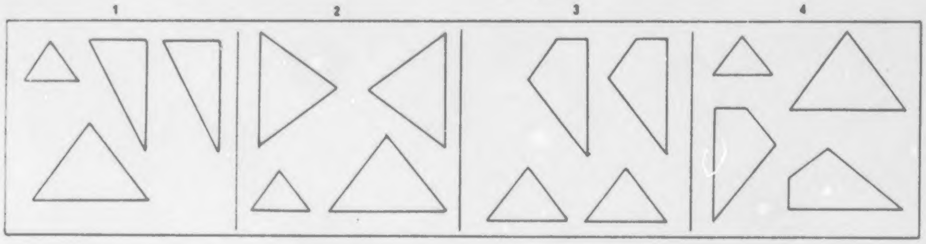
Name ____________________

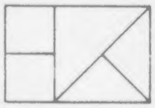
In each of the following exercises you are given a model. Choose the box which contains all the parts that make up that design and write its number in the circle provided.

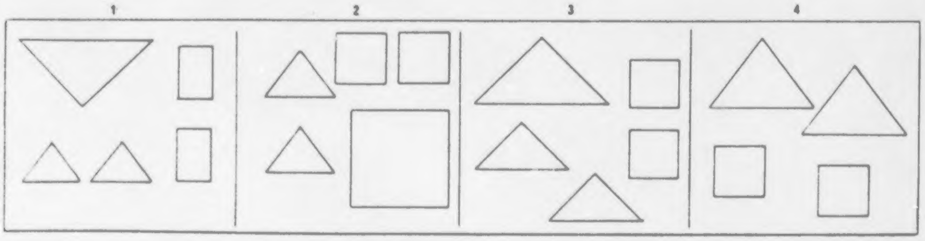
○ 



○ 



○ 



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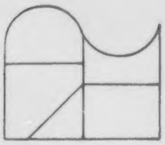
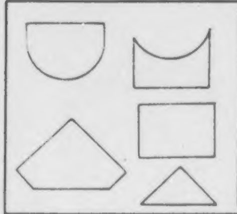
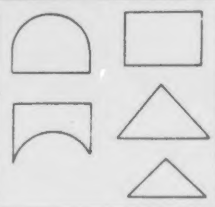
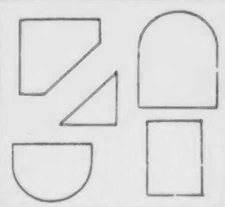
Name ______________________________

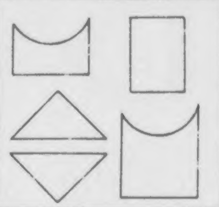
In each of the following exercises you are given a model. Choose the box which contains all the parts that make up that design and write its number in the space provided.

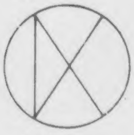
○ 

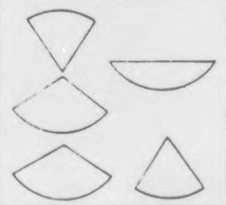
1 

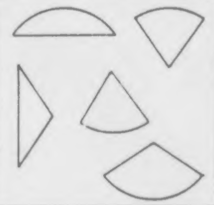
2 

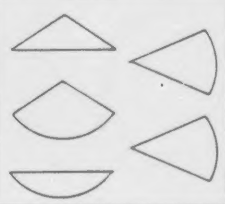
3 

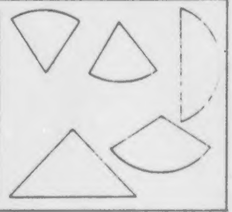
4 

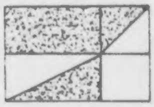
○ 

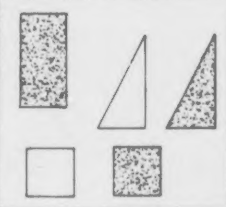
1 

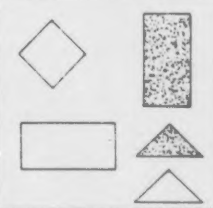
2 

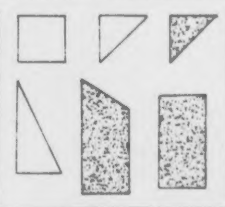
3 

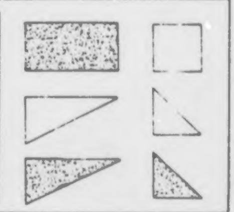
4 

○ 

1 

2 

3 

4 

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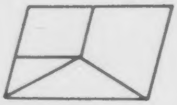
Name ____

In the large frame you have several models. Choose the box which contains all the parts that make up that design and write its number in the space provided.



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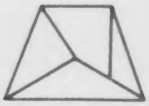

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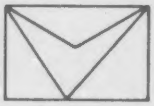

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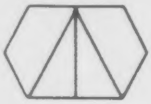

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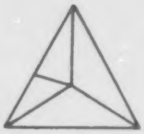

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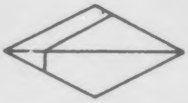

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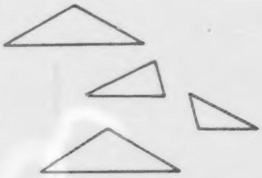

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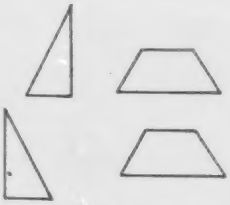

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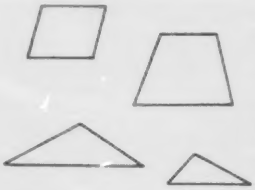

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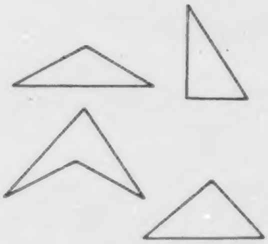

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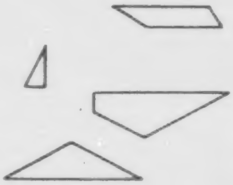

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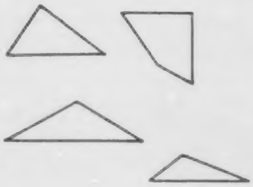

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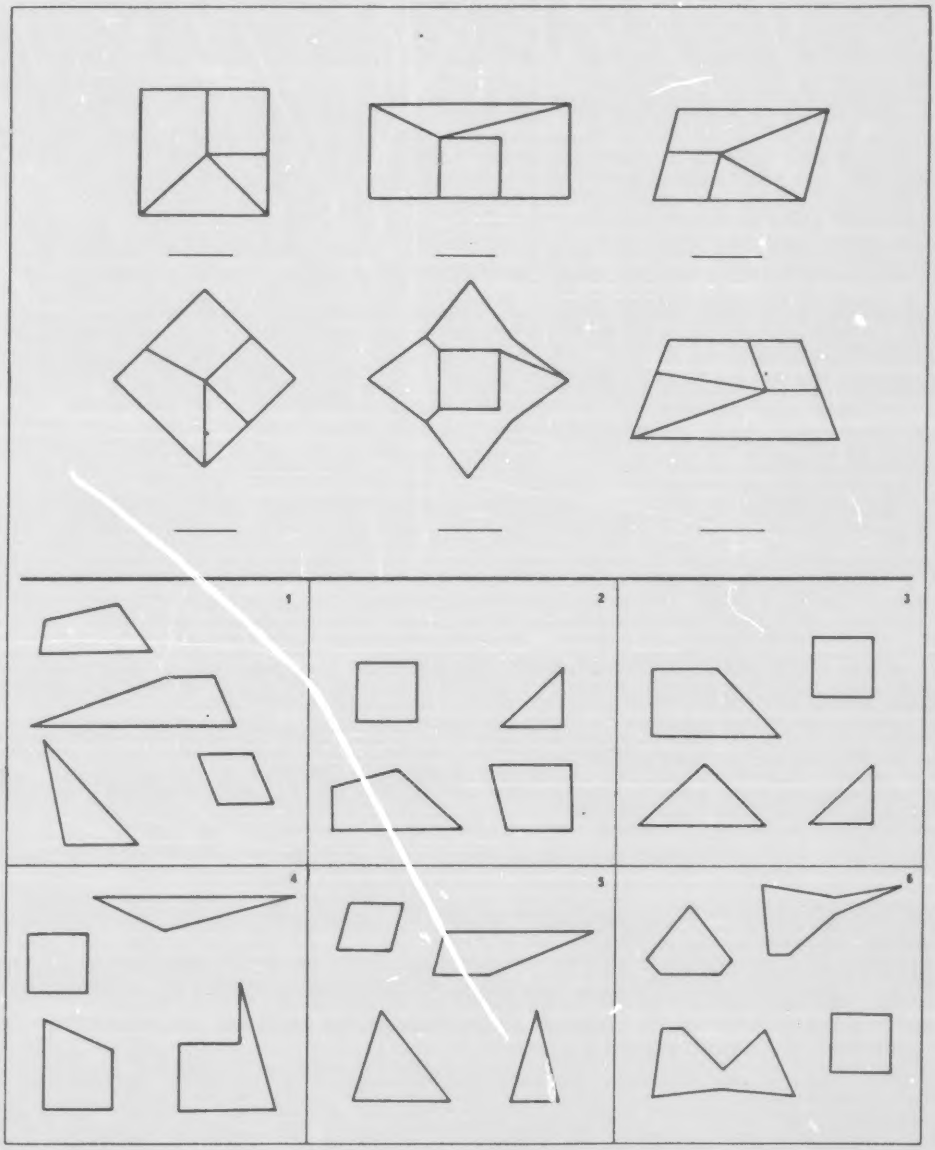
Name ____________________

In the large frame you have several models. Choose the box which contains all the parts that make up that design and write its number in the space provided.



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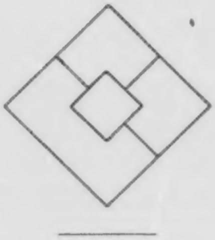
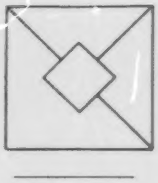
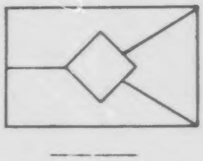
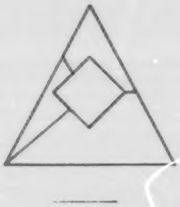
AP
12

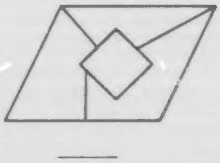
In the large frame you have several models. Choose the box which contains all the parts that make up that design and write its number in the space provided.

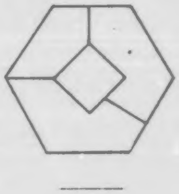


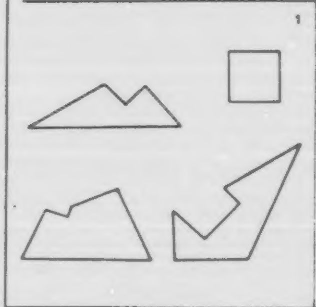












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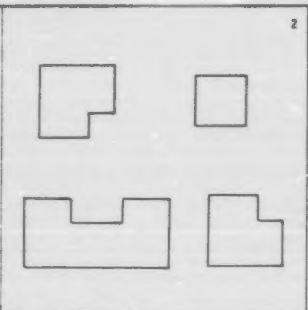

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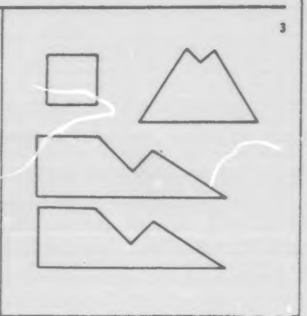

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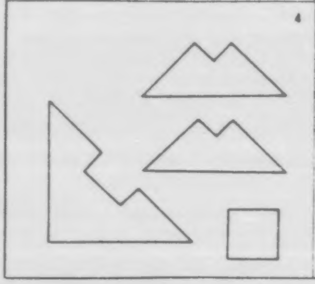

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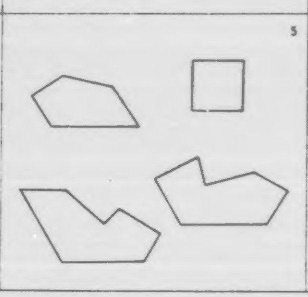

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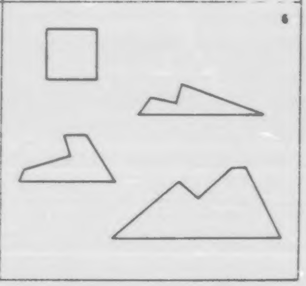

6

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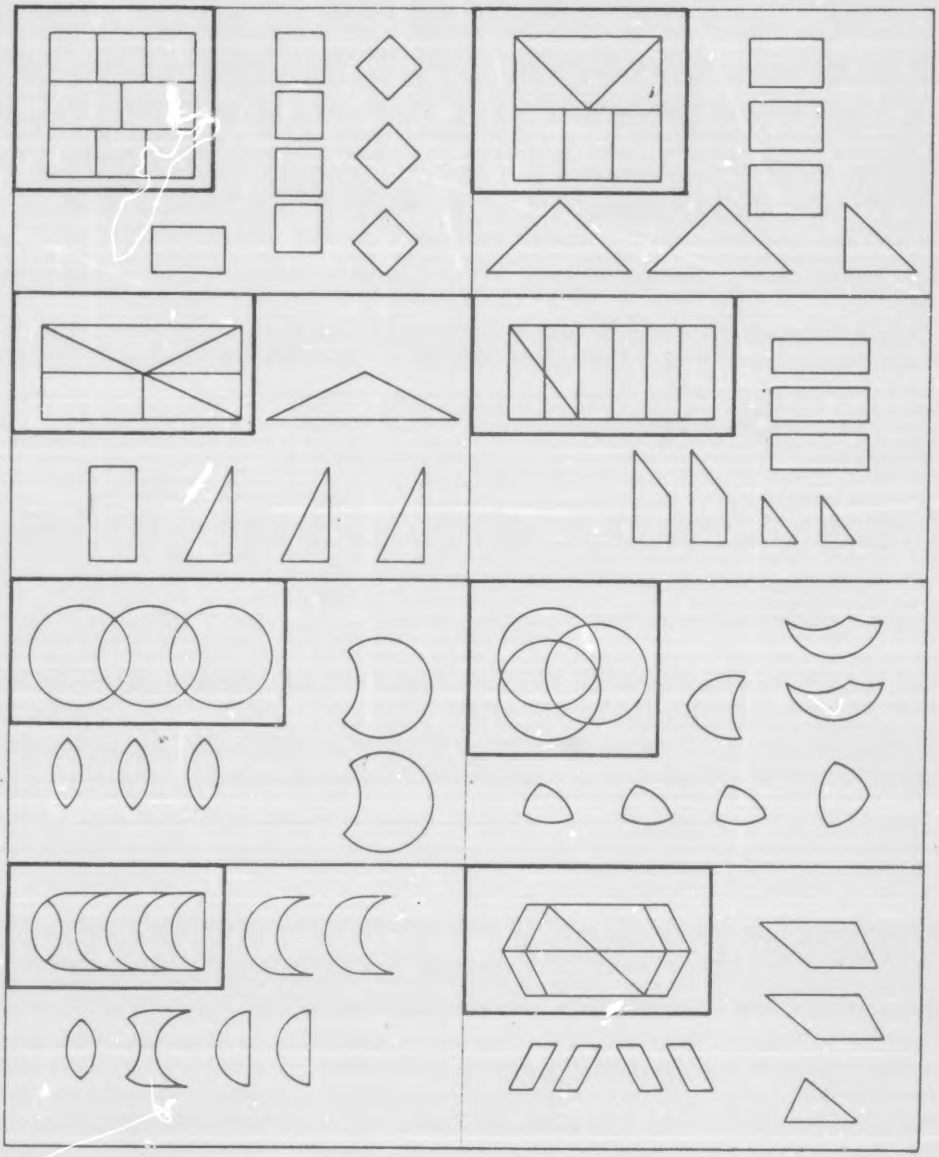
AP
13

Name ____

Correct the errors.

Do the separate parts in each frame fit together so that they form the complete design? If they do not, correct.



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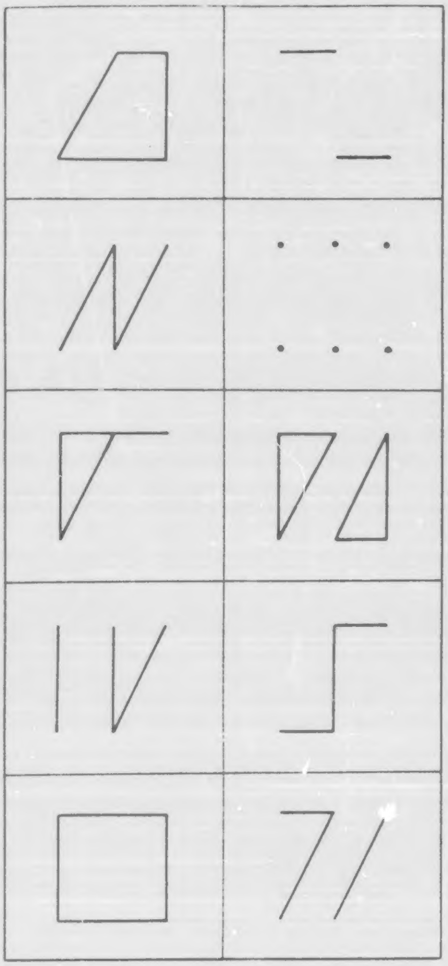
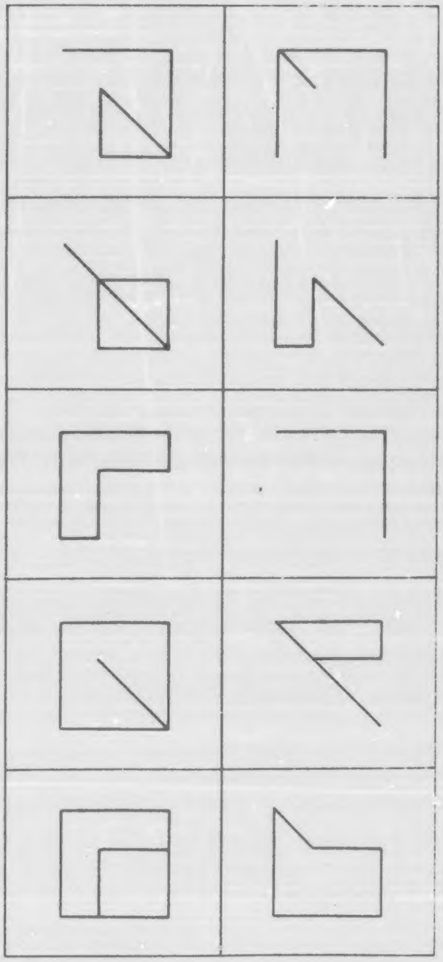
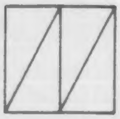
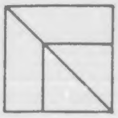
Name ____

To the left of each section, there is a design.
Finish each of the drawings so that, when completed, each is the same as its model design.









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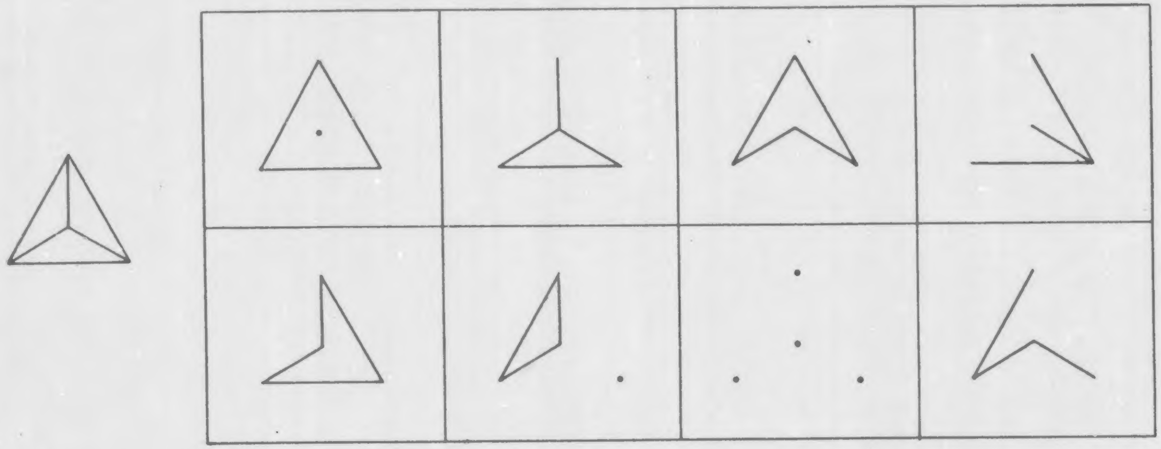
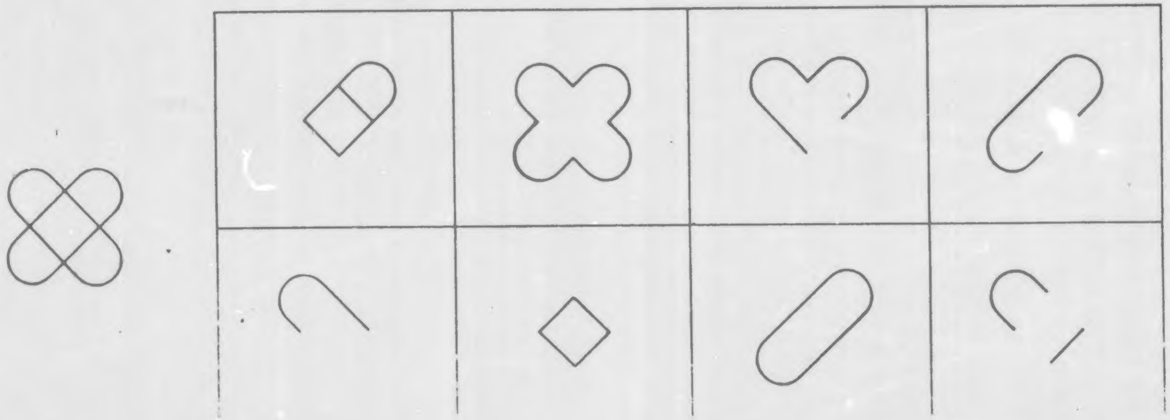
Name ______________________________

To the left of each section you will find a design.

Finish each of the drawings so that, when completed, each is the same as its model.





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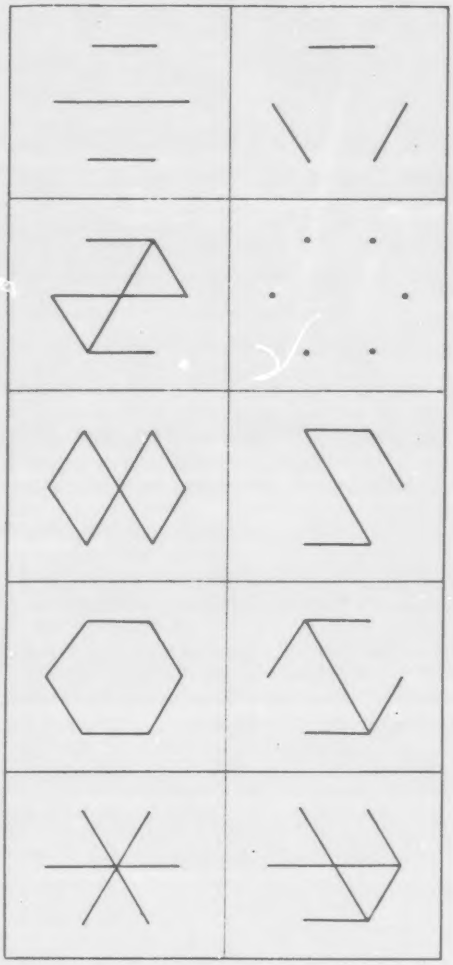
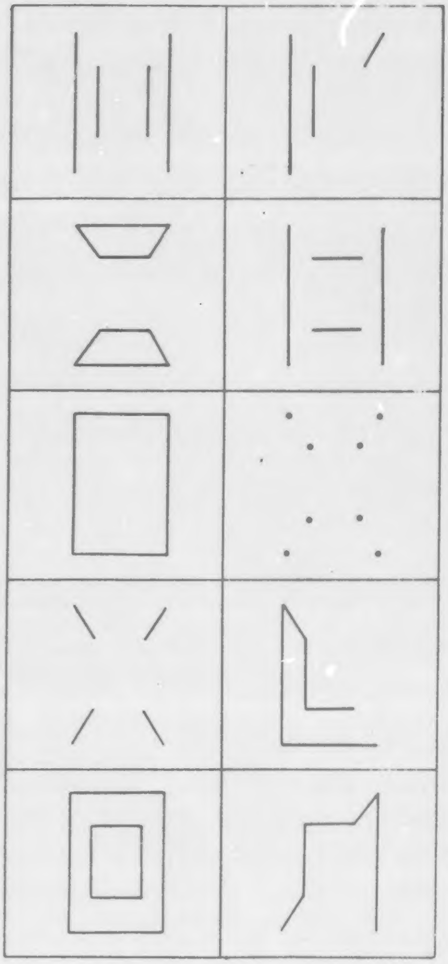
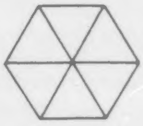
AP 16

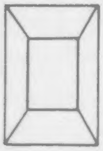
Name____

To the left of each section you will find a design.
Finish each of the drawings so that, when completed, each is the same as its model.









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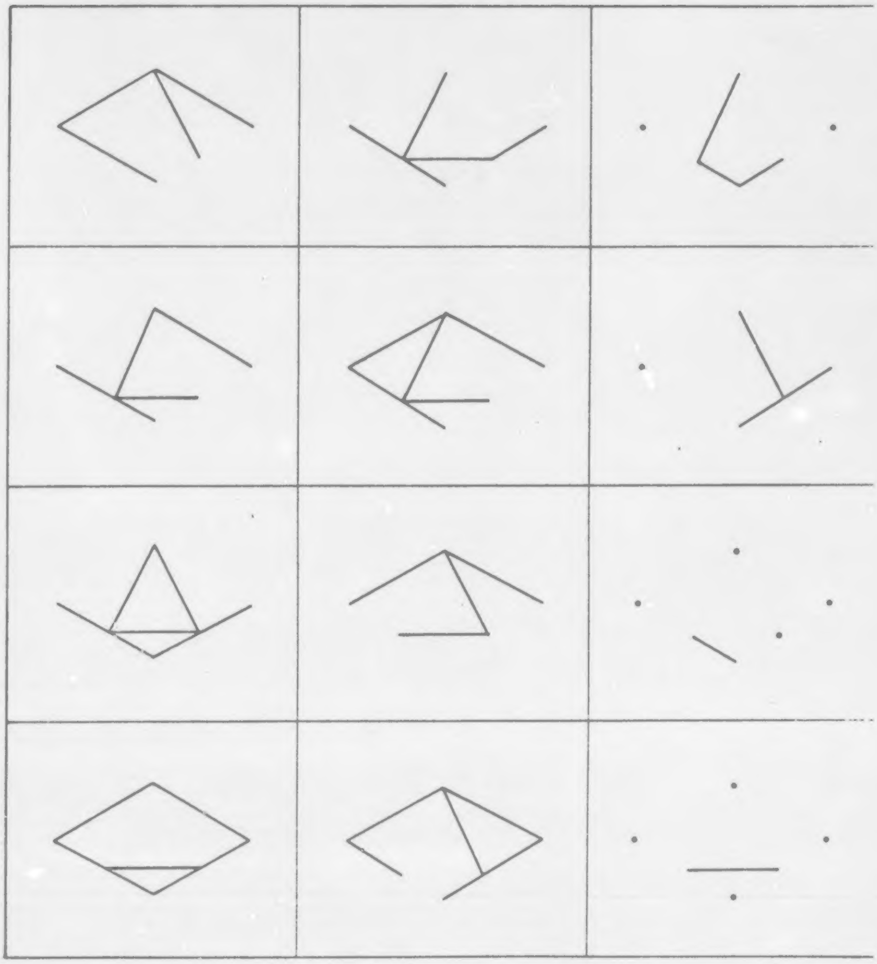
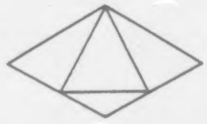
Name ____

To the left of the large frame you will find a design.

Finish each of the drawings so that, when completed, each is the same as the model.





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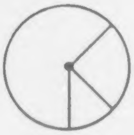
Look at the figure at the top of the page. For each drawing in the left column, there is a drawing in the right column which completes it. Write the number and the letter of the two drawings you combine to make the complete figure.



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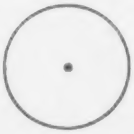

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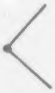

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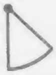

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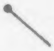

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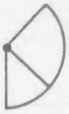

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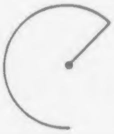

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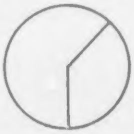

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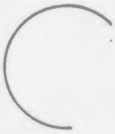

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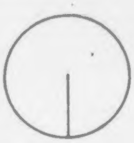

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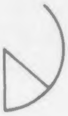

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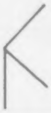

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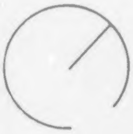

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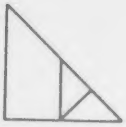
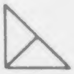
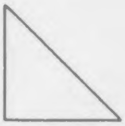
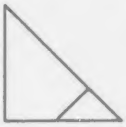
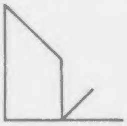
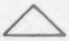
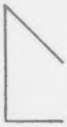
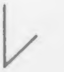
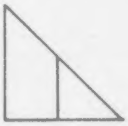
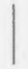
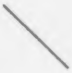
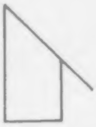


1 	____________	A 
2 	____________	B 
3 	____________	C 
4 	____________	D
5 	____________	E 
6 	____________	F 

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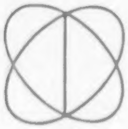

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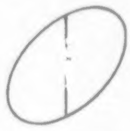

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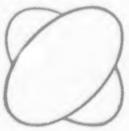

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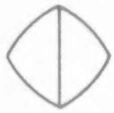

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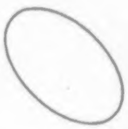

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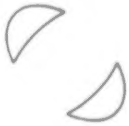

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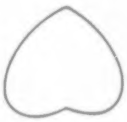

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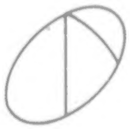

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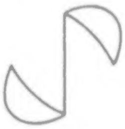

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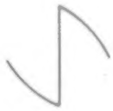

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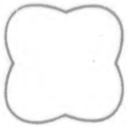

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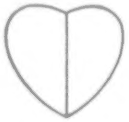

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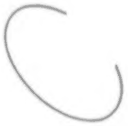

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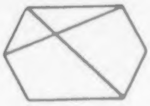

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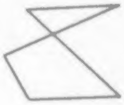

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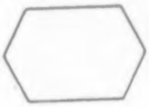

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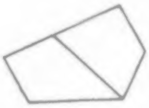

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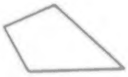

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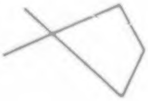

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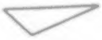

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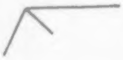

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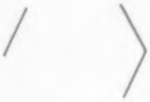

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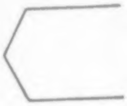

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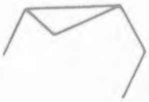

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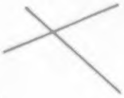

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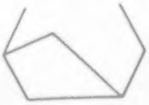

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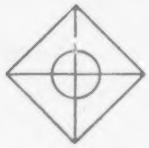

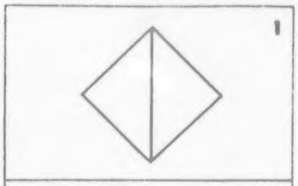

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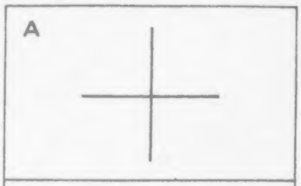

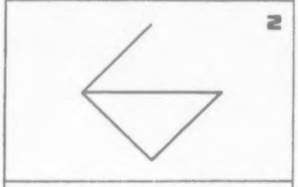

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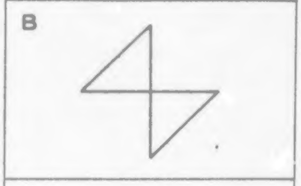

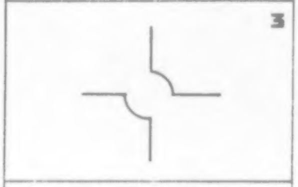

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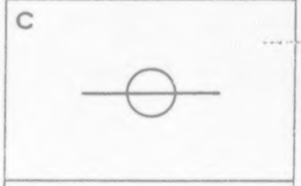

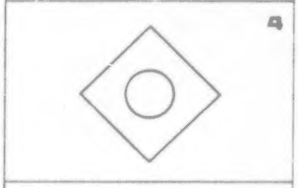

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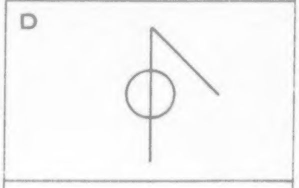

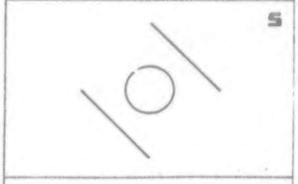

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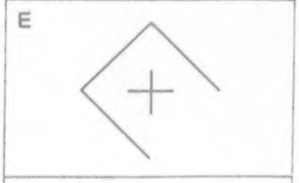

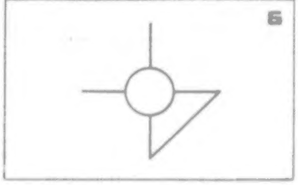

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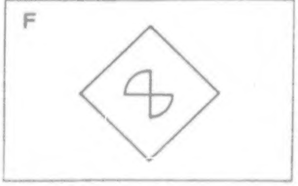

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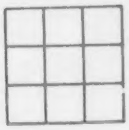

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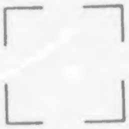

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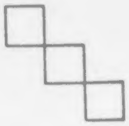

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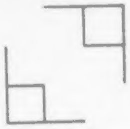

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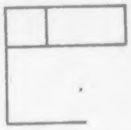

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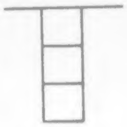
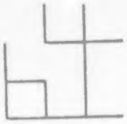


C



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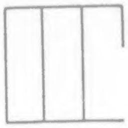

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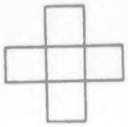

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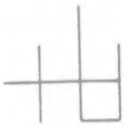

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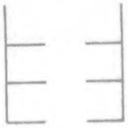

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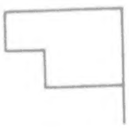
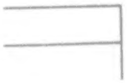


F



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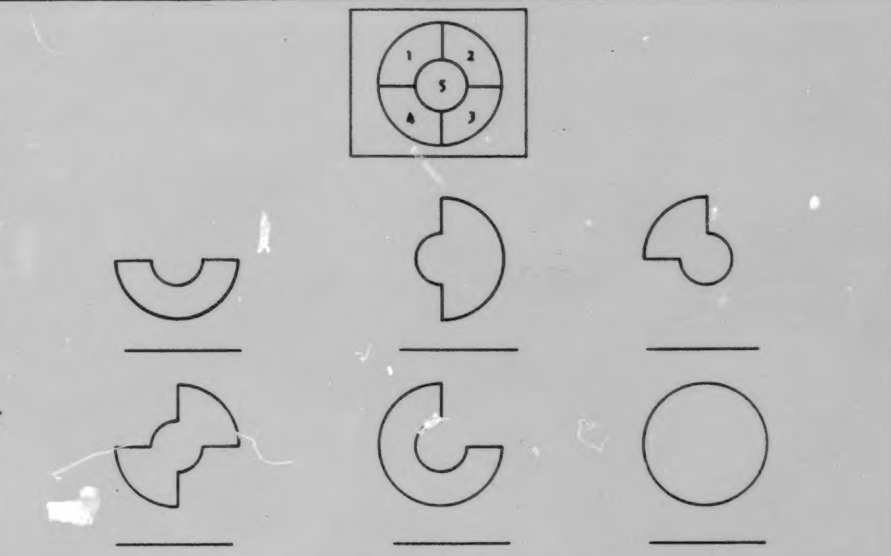
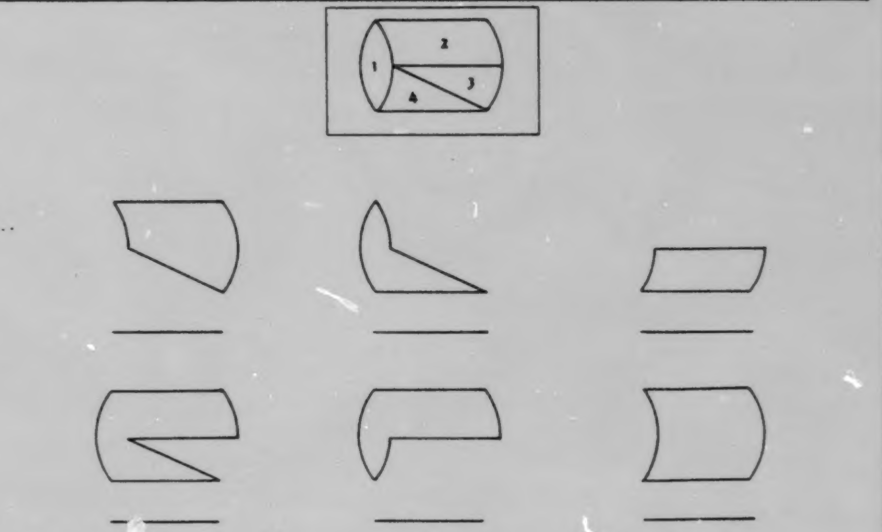
Name ______________________________

Each section which appears below the given design is composed of a number of parts. On the line beneath each section, write the numbers of the parts it contains.





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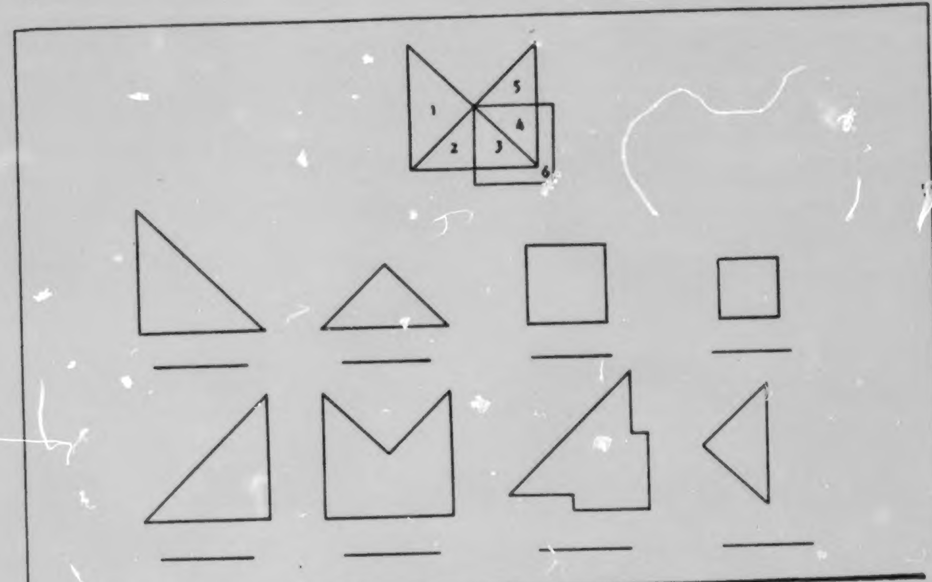
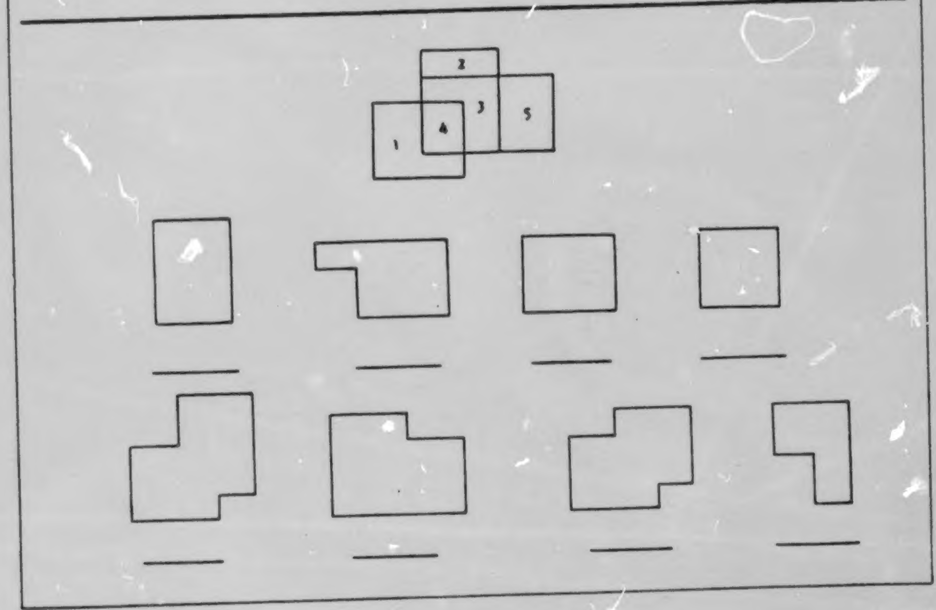
Name ____________________

Each section which appears below the given design is composed of a number of parts. On the line beneath each section, write the numbers of the parts it contains.





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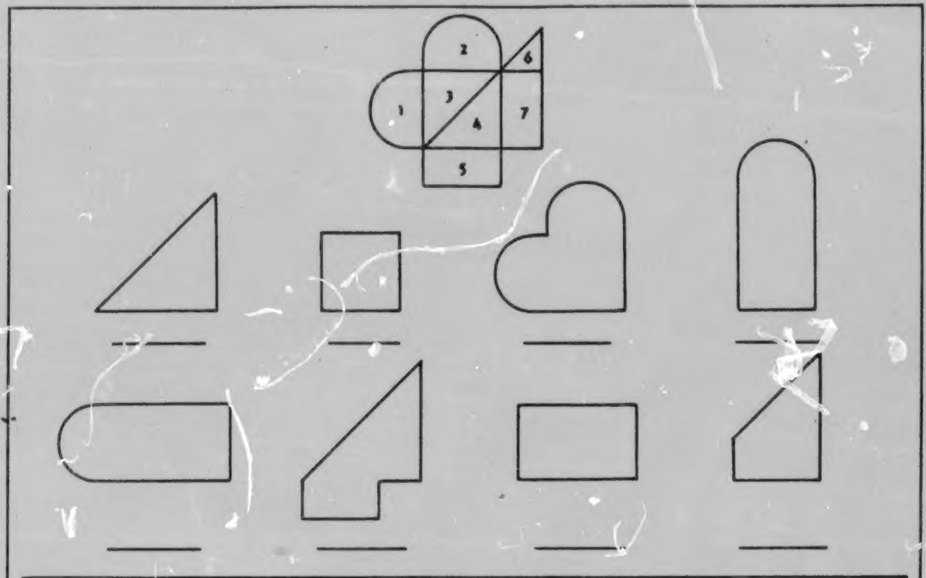
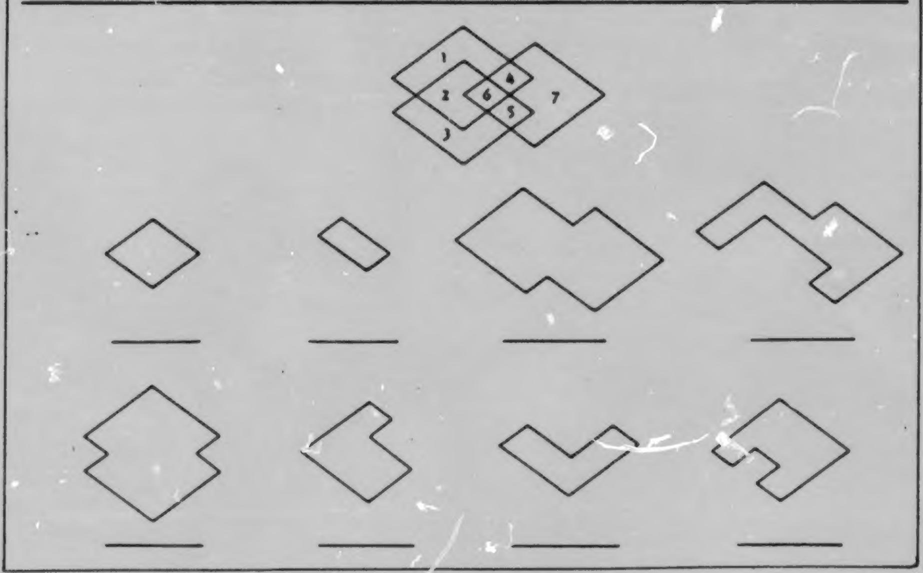
AP 26

Name ____

Each section which appears below the given design is composed of a number of parts. On the line beneath each section, write the numbers of the parts it contains.





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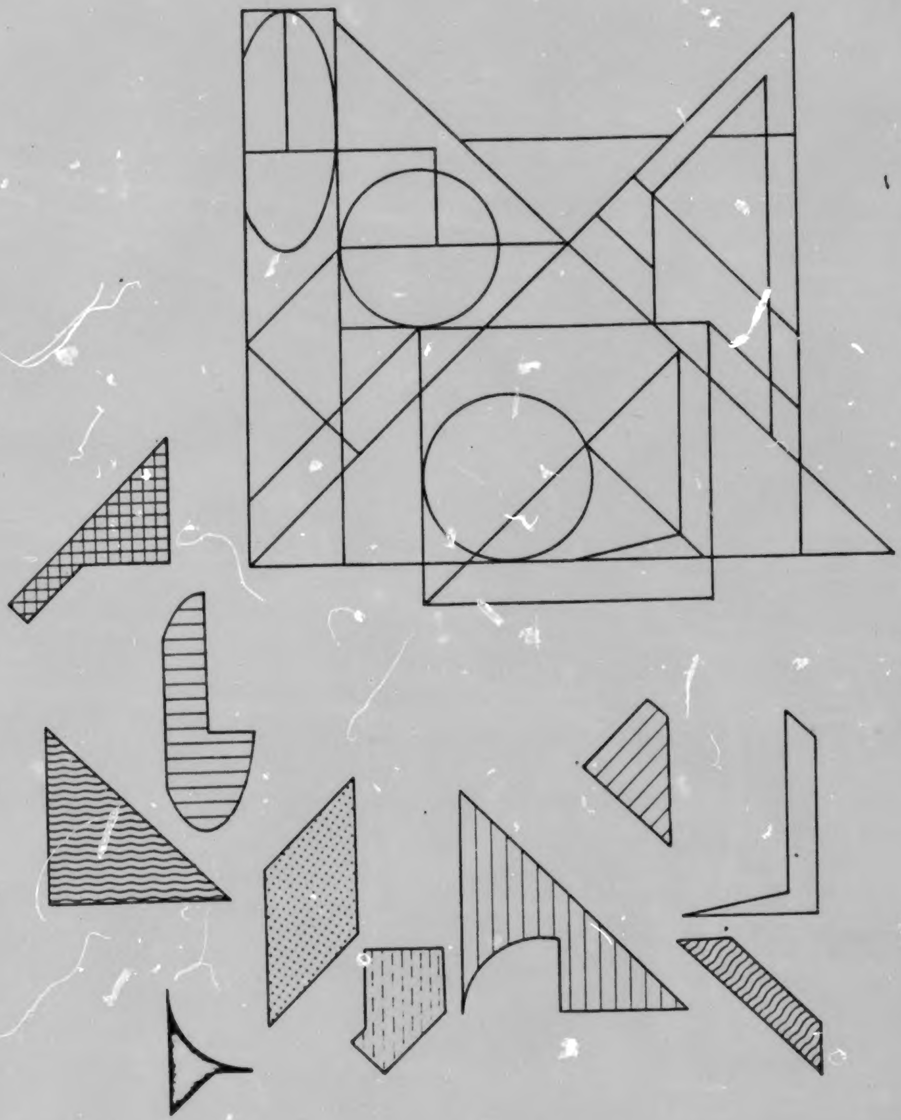
AP 27

Name ______________________________________

Each section which appears below is a combination of several parts of the large design. After you find the appropriate section in the design, make it correspond to its model.



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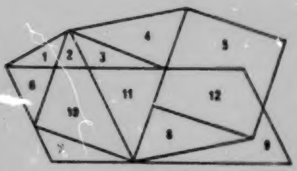
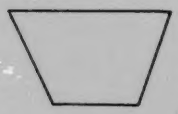
AP 28

Name ____

Correct the errors.

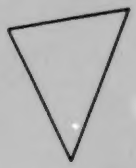
In each frame below you will find a drawing which is composed of parts of the model given at the top of the page. Under each drawing you will find the numbers of the parts. If the given numbers are correct, mark a + in the small circle. If the numbers are incorrect, mark a - in the small circle, and correct the given numbers.





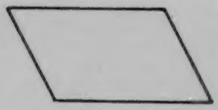
○

6 ,7 ,10 ,11



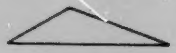
○

3 ,8 ,11



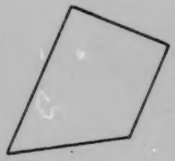
○

11 ,12 ,8 ,9



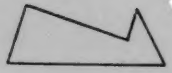
○

1 ,2 ,3 ,4



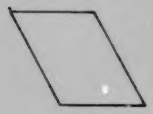
○

2 ,3 ,10 ,11 ,7



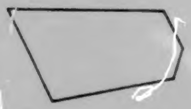
○

8 ,9



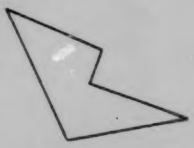
○

1 ,2 ,6 ,10



○

11 ,12 ,8 ,9



○

9 ,8 ,11 ,3

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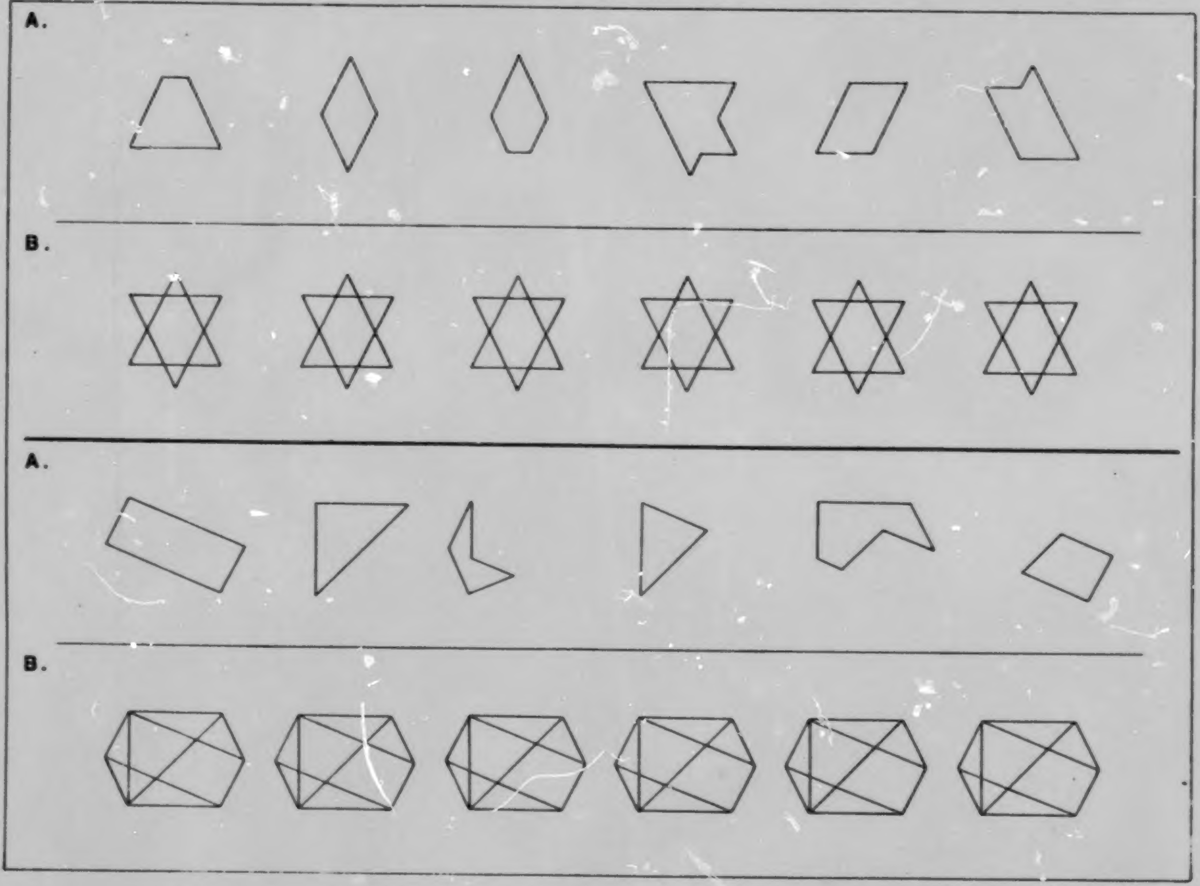
Each figure in Row A appears in the completed design beneath it in Row B. Locate the figure and color it.



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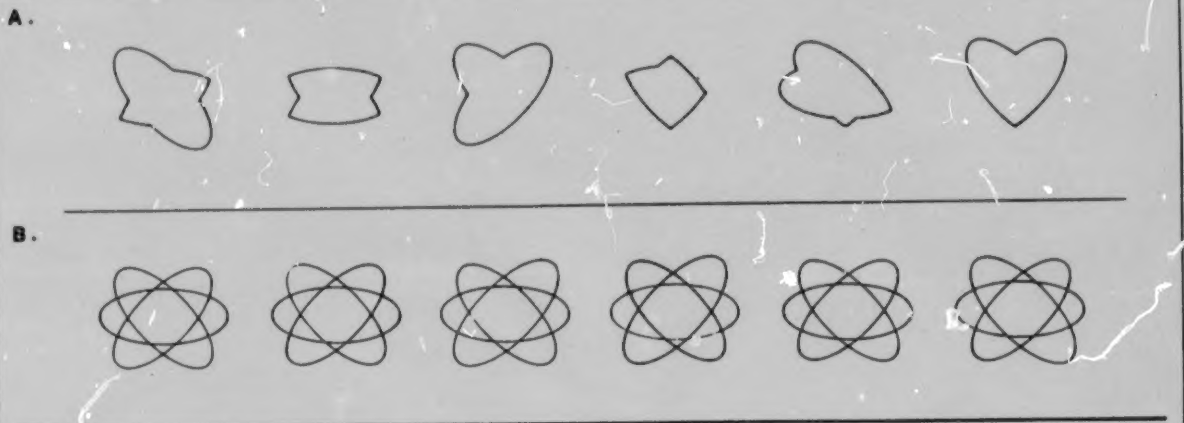
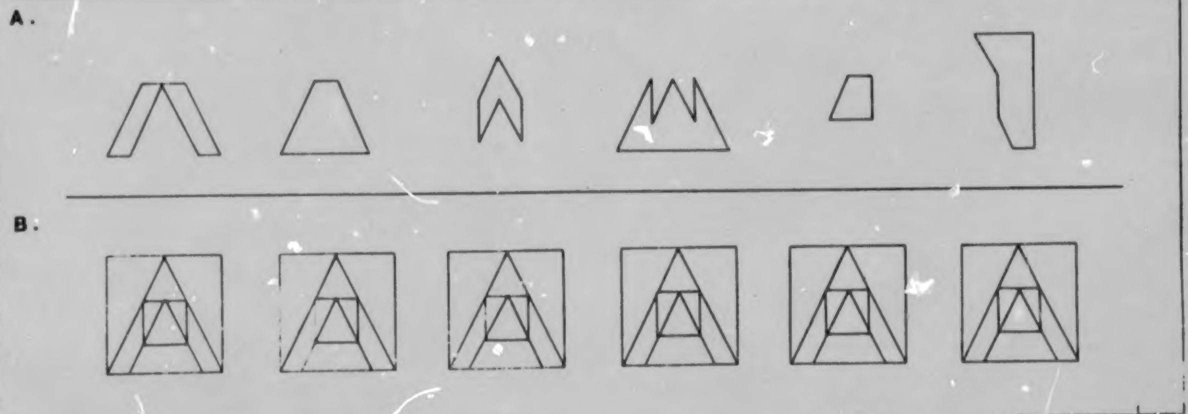
Each figure in Row A appears in the completed design beneath it in Row B. Locate the figure and color it.





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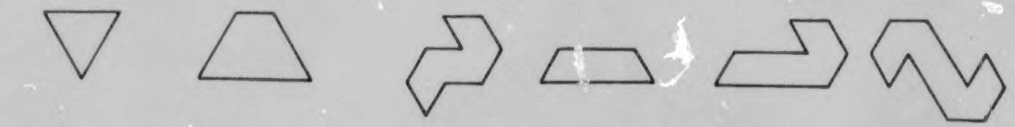
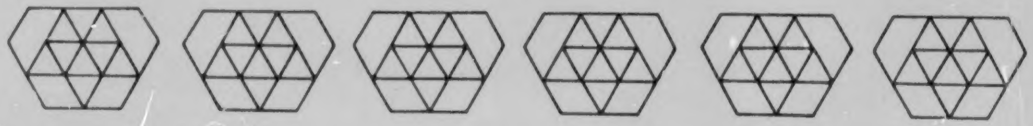
AP 32

Each figure in Row A appears in the completed design beneath it in Row B. Locate the figure and color it.

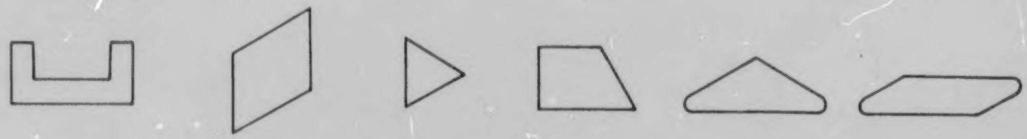
A.



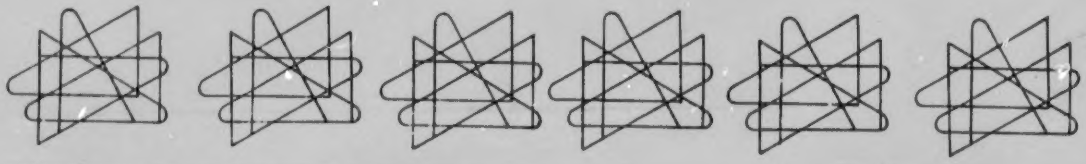
B.



A.



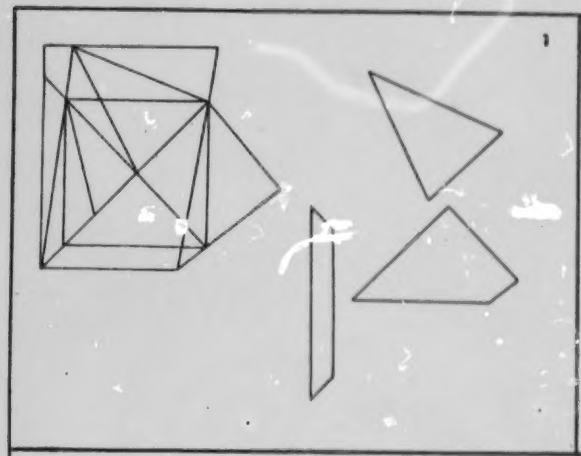
B.



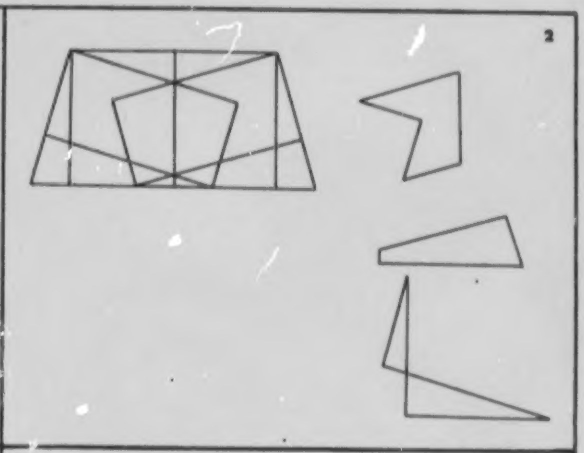
In exercises 1 and 2, locate the three model sections in the complete design and color them.

In exercises 3 and 4, the completed design has shaded sections. Locate those sections in the sketched design on the left and color them.

1



2



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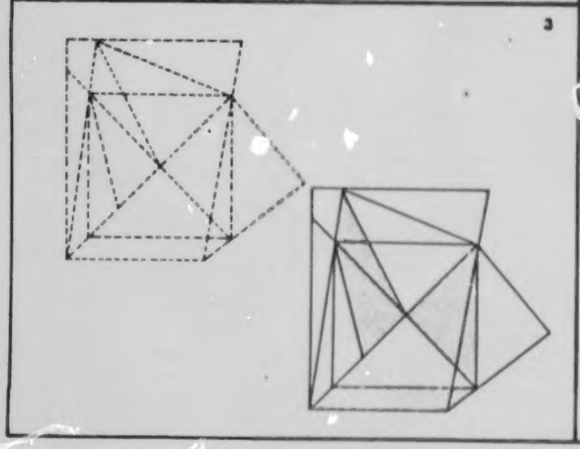

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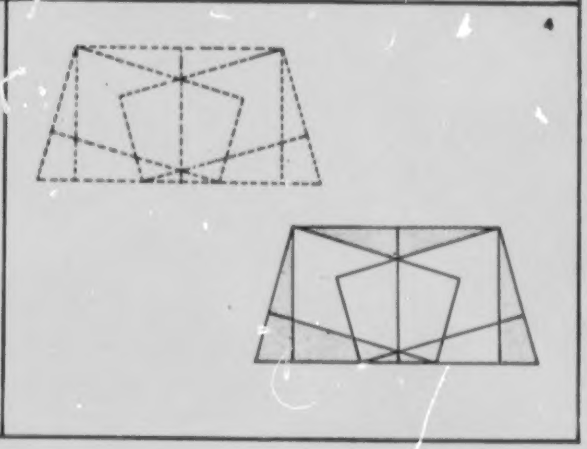

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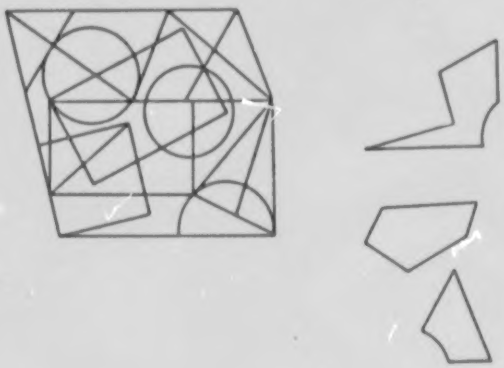
AP
33

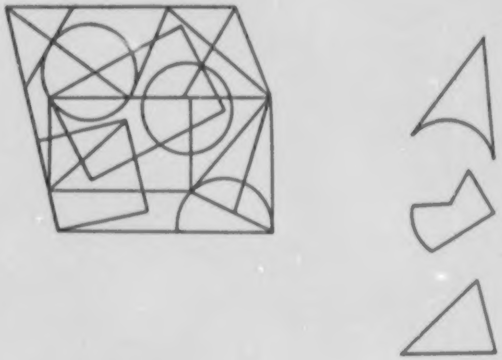
In exercises 1 and 2, locate the three model sections in the complete design and color them.

In exercises 3 and 4, the completed design has shaded sections. Locate those sections in the sketched design on the left and color them.

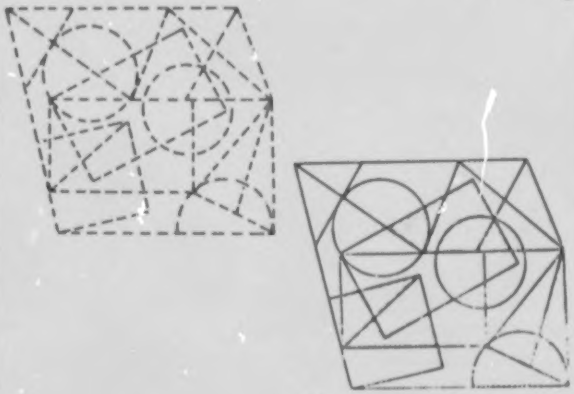
1



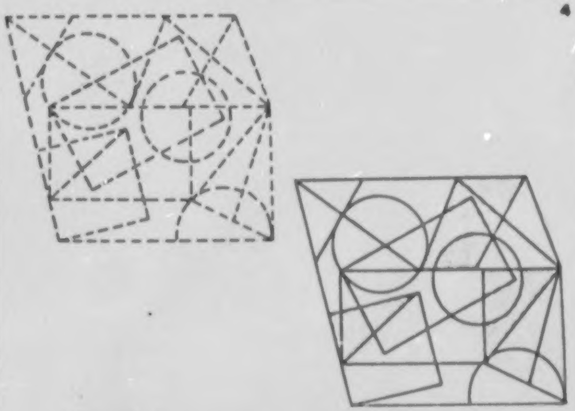
2



3



4



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34

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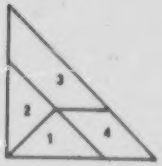
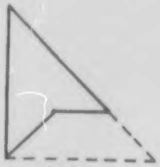
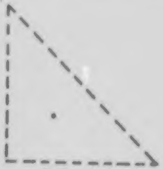
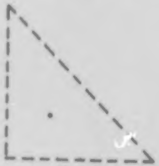
AP 35

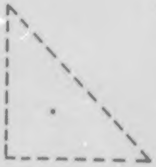
In each of the following outlines, you are to draw the section that is composed of the parts whose numbers appear beneath the outline.. Pay attention. Do not include the lines between the parts you draw.

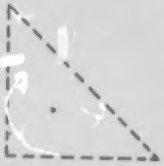


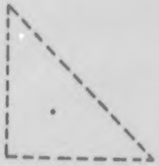

2-3


1-2


1-4


1-3-4


1-2-4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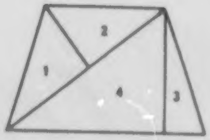
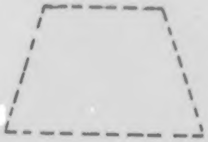
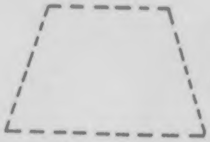
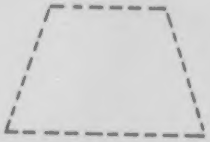
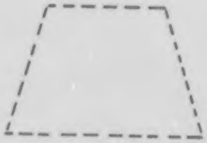
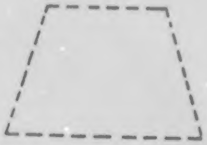


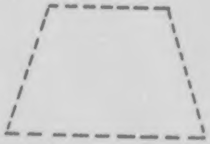

3-4


1-2

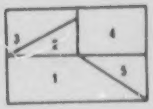

2-4

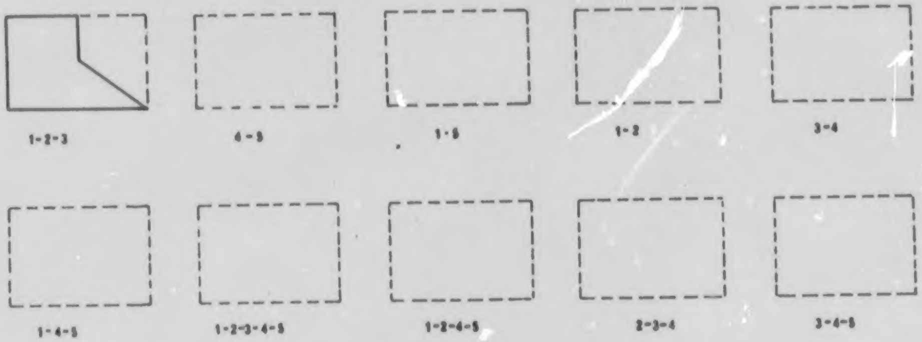

2-3-4

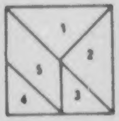

1-2-4

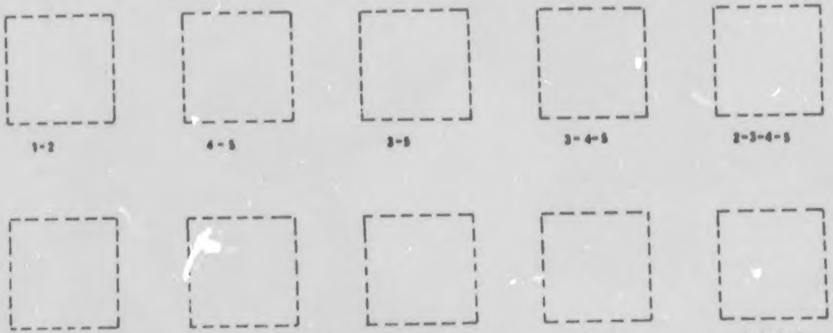

1-3-4

In each of the following outlines, you are to draw the section that is composed of the parts whose numbers appear beneath the outline. Pay attention. Do not include the lines between the parts you draw.




1-2-3
4-5
1-5
1-2
3-4
1-4-5
1-2-3-4-5
1-2-4-5
2-3-4
3-4-5




1-2
4-5
3-5
3-4-5
2-3-4-5
1-4-5
1-2-3-4-5
2-3-5
1-2-3-5

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AP
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AP 37

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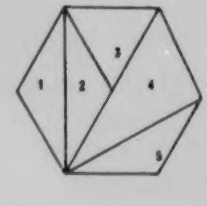

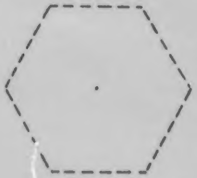
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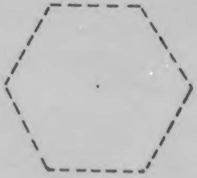
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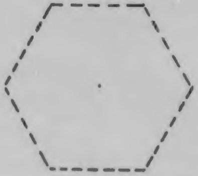
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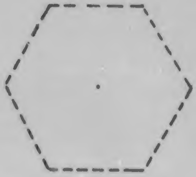
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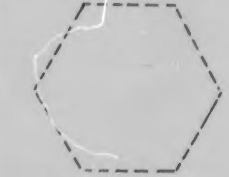
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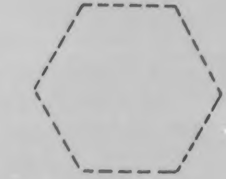
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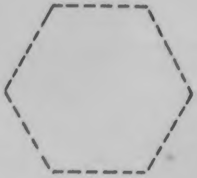
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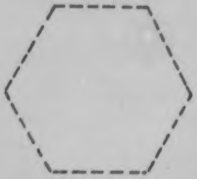
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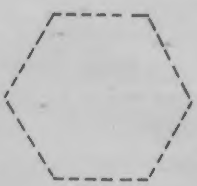
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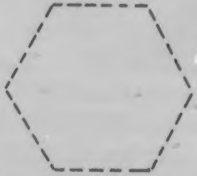
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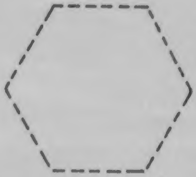
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AP 38

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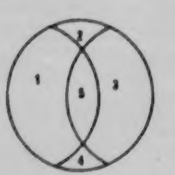

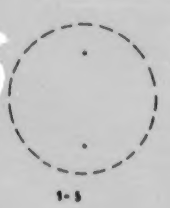
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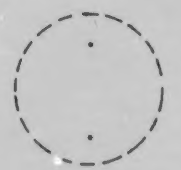
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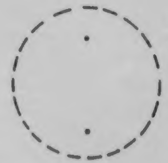
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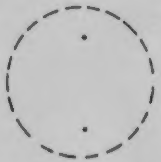
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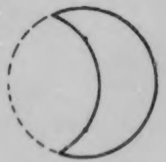

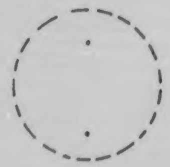
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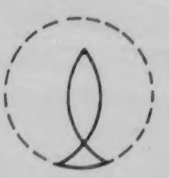

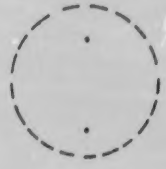
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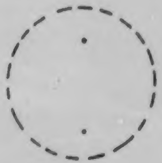
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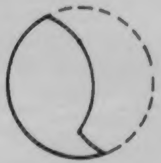

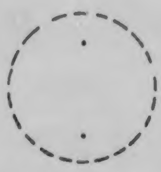
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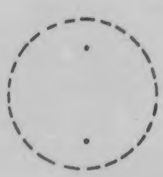
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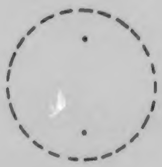
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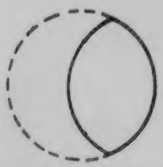

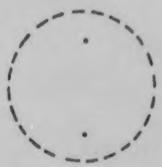
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5. What are some words or expressions used in Liberian English that seem to have no counterpart in American English (e.g., words or expressions concerning items or situations that one does not encounter in the U.S.)?

6. What differences do you notice in the way English is spoken by various groups of Liberians (i.e., of various educational, ethnic, and socio-economic levels) when speaking to each other, to someone from a different social level, and to foreigners?

7. What are the reactions of these various groups of Liberians to the use of Liberian English by foreigners (especially PCVs)?

A SMALL COLLECTION OF EXPRESSIONS FROM LIBERIAN SPEECH

2nd Edition

compiled by Tom Wheeler

printed by
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Portales, New Mexico
December, 1979
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white thing	a traditional gift or token o respect and good intentions (d'A.)
witch	sorceror; sorcery. This English term is used very loosely to include all those persons and practices which involve magic with evil intent. But it is used by many tribal peoples with specific reference to equivalent terms in their own languages. The concept of "witch," to most persons in Liberia, connotes a special kind of evil spirit with which certain people are born, or which may enter a person and use him or her as a host. Such a spirit controls its host and forces him or her to do destructive things, such as bringing sickness to others, ruining crops, eating unborn babies and human souls. The witch spirit may leave its host while he/she sleeps and wander about doing terrible deeds. To say someone is a witch really means that he or she "possesses" or "has" a witch. To "make witch" means that one is using the services or powers of a witch to do harm to others. To "have wilch on one" means to be the target of a witch's evil intent. To "catch witch" is to discover and trap a witch through counter-magic. (d'A.)
witness (wisnah)	see. "You witness the kung fu pictures?" (Did you see the show?)
yah?	Did you hear me? (Do you understand what I've just told you."
yana boy	street peddlar. A petty trader who carries his wares about the town.
your	also means you (plural); y'all. "What time your came?" (When did y'all get here?) "Your must clean the place before leaving."
zute/zoot	to dress up. "On Christmas and the 26th of July, you can see everybody zooting." (Everybody puts on his/her best and walks around town.

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abuse	to malign with offensive language. The word means much the same as in American usage but is probably used with greater frequency in Liberia. "The man abuse my ma!" (He said something uncomplimentary about her—a grievous insult in Liberia.) "Teacher, Boima abuse me-o!" (Perhaps Boima called him/her a damn fool.)
again	1) after all. "You not going again?" (So you decided not to go after all.) It does not mean going for a second time (which, if it's for food or drink, would be, "You going for round?"). 2) now; this time. "What happen again?" (Now what's the matter?) 3) any more. "I can't do that one again." (I don't do that any more.)
ass-trick	nonsense, foolishness. "That man good-good job spoil on ass-trick." (He lost a very good job for some foolish reason.)
ba	friend. "I say ba, what time you going in town?"
baby ma	a woman who has a young baby. Can also be used as a form of address. "Take time with that girl—that baby ma-o!" (Stop flirting with her; she has a young (nursing) baby and therefore is not interested in making love right now—or shouldn't be!) "Sarah Ma, yeah the food what my ma sent you." (Mother of Sarah, here's the food my mother has sent to you.)
bad kinda way	in the worst way. "I want wisnah the picture bad kinda way, but no money, Jack!" (I really want to see that movie, but no way, José!)
balance	the remaining portion "These pekins will eat the balance rice." (The small children will eat what's left over.)
beat up	of poor or disappointing quality. "The people party was too beat up." (A flop)
beg	to solicit or plead. "I beg you!" (Pretty please.)
behold	alas. "I thought we finish fixing the palaver, behold the woman still vex with me!" (I thought we had settled our differences; to my surprise, she's still made at me!)
bobo	a deaf mute
boney	a small, common fish that has a lot of bones but is otherwise delicious. The dried (smoked) boney is used to flavor stews and sauces.
book	1) to know book means to be formally educated (regardless of the level of education). "That sabby woman; she know plenty book." (That's a very intelligent woman; she's well-educated.) 2) as a verb, to catch, write up, or penalize somebody for an offense. "The officer book the taxi driver--no license!" "The principal book the children for disturbing the program."
born	1) to give birth to. "Hawah born a boy child." 2) true genitor. "He my born pa." (He's my real father, not my step-father or guardian (who would also be addressed as "pa").)

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boron	a small cheat sheet, concealed in one's pocket, up a sleeve, or under a thigh. Teacher to students: "I know none of your can pass except for boron." (Cheating is the only way most of you will make it through this course.)
bra	brother, friend. "I say, bra, you hear about the new picture?" (My good friend, have you heard about the new movie in town?)
bug-a-bug	termites
bullshit	in common use and not considered particularly offensive. "Let me go bullshit those girls small." (impress them with my ways) "That so-so bullshit the man talking." (Don't believe a word he says.)
business	matters, concerns. "That your business!" (A common response of indignation when a request has been refused.) "That not small boy-o! He know woman business." (He's not a child; he has slept with a woman before.)
butter pear	avocado
can/can't	to do something habitually. "My pa can make farm." (My father is a farmer.) "I can't eat hog-o!" (I don't eat pork. A religious taboo among Moslems.) Can and can't are likely to be pronounced alike except for an important difference in tone: "I càn do it." (low tone on can) = I usually do it. "I cán do it." (high tone on can) - I usually don't do it.
cane juice	locally-made rum
carry	to take along. "Carry this letter to your pa." (Take this to your father.) "When you go to the States, you must carry me-o!"
cartoon	a box or carton
chakla	confusion; to cause confusion; to be mixed up. "The man full of chakla." (He likes to cause trouble.) "Everything here chakla." (Things are not going according to plan.)
charge	1) to fill up. "Charge my glass." (Fill 'er up!) 2) to search. "The police charge(d) the rogue's pockets." (looking for something stolen)
charged	intoxicated. "The man charged in the head."
children	also refers to adolescents and young men and women who are in school (including senior high school and college); usually used to refer to one's schoolmates. "To get those children to clean up after the party ain't easy-o!" (comments made by the party chair about her 12th grade classmates.)

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them	and all the rest of the people. "Carry these bananas to your ma them." (Take them to your mother and the other people in her house.)
tie one's face	to frown or scowl. "Pekin, how you tie your face so?" (Did somebody make you mad?)
tight	of small but wiry build. "The man you talking about, he tight?" (Is the man you're describing to me rather short with lean muscles?)
toilet	(v) to defecate. "Ma, your baby now toilet-o!" (He/she has just soiled the diaper.) (n) feces. "Mary, come move the toilet from here." (Come clean up this mess your baby brother just made on the floor.) restroom. "Teacher, I want go in the toilet."
topogi	a potash or soda obtained from ashes of certain plants or from mineral deposits. It is often used when sea salt is not available, but provides a flavor accent of its own, which is relished particularly among the Lorma people. (d'A.)
torch	flashlight
tote	to carry (a load)
use	to take advantage of. "The teacher really use(d) those children." (He probably took advantage of his th to berate the students, or to make the do a lot of extra work.)
vexed	annoyed, angry (very common word)
walkabout	stroll; promenade. "What place you going?" "I go walkabout." (I'm just going to stroll around the town.) Can also suggest looking for company of the opposite sex. "Let's walkabout to Hawa's." (Let's go visit her.)
wa' ple?	what place? = where. "Wa' ple you stay?" (Where do you live?)
waste	to throw away or accidentally spill. "Oh! How you wasted water on me so?" (You splashed me when you threw out the water.) "The rice waste-o!, my people!" (Somebody knocked it (the pot) over.)
wata police	prostitute
waterside	waterfront. That part of a village or town which is along the water--usually a marketplace, quarter, or boat landing.
wa' tine?	what time = when. "Wa' tine you came? (When did you arrive?)
wa' ting?	what thing = what. "Wa' ting you talking?" (What are you talking about?)
what to do?	that's life; c'est la vie. Nothing much you can do about it. Often said with a gesture of clapping the hands once and then opening them, palms up.

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speed	self-confidence; assertive flattery. "The way he got that job--the man got speed-o!" (He sweet-talked his way into it.) "If you want that girl, you must run your speed-o!"
spend	to pass the time. "How you spend the night?" (How did you sleep?) "I going to spend time to my auntie them." (I'm going to visit my aunt and her family for a few days.) to spend money. "That man can spend-o!" (He's not stingy.)
spoiled	broken. "My watch spoil-o!" (It's stopped for good.) "How you manage to spoil the people car?" (What did you do to wreck their car?)
spy	to catch a glimpse of. "I spy her in the store." (I saw her in the store--but didn't get a chance to speak to her.) to cheat. "Teacher, Joseph want spy my paper-o!"
stick	refers not only to small, slender pieces of wood but can also indicate a log several inches in diameter
story	fabrication, lie. "That story, yah!" (I don't believe you.) Not as accusatory or inflammatory as, "That lie, yah!" or "You lie!"
straight	right away. "When he spy the cat eating the fish, he chunk it straight!" (As soon as he saw the cat eating the fish (that they may have been drying in the kitchen), he hit it with a rock.)
stranger	guest
stranger father	host
sweet	delicious. "Ghusa jamba sweet-o!"
suck one's teeth	to make a hissing sound by sucking against the teeth. A serious insult.
take time	watch out; take it easy; be careful. "Take time for the dirty water." (Watch out for that stagnant drain water.) "Take time with the people daughter." (Don't get her in trouble.)
thank you	in addition to expressing appreciation for a gift or favor done, it can also mean I'm happy for you; that's fine; congratulations; your're welcome; I'm glad; etc. "Thank you for your new lappa." (What a pretty lappa you have! (does not mean that the lappa has been given to the one saying thanks).) "Thank you for your new baby." (Congratulations.) I hear you passed your examinations . . . Thank you!"
there	"I not there-o!" (I was not involved in any
too; too much	very. "My friend too good to me-o!" (He has done well for me.) "That man fat too much!" (He's huge.)
time	"Time he was to the country, ..." (When he was living upcountry, ...) "Once upon a time ..." (Response: "Time!") The way tales begin in Liberia.

chunk	to throw at. "You see the children chunking the keke?" (Look at those kids throwing rocks at that emaciated dog!) "When we fini' with this work you must chunk us-o!" (You'd better give us something good.)
citizen	A name jokingly given to dogs, especially when they sit in the road, unconcerned by traffic.
civilized	also called kwi. Refers essentially to religion (usually Christianity) and education (usually western style, that is, European or American, which would also include a person who has graduated from high school or college in Liberia). The terms "civilized" and "not civilized" are used extensively in Liberia and imply a practical cultural distinction rather than an invidious one. (d'A.)
cold water	a gift to sooth ruffled feelings, to appease anger, or to ask forgiveness. "Now that we fini' talking the palaver, where my cold water?" (Now that I have agreed to a compromise (or have helped you people reach an agreement), show your appreciation.)
come	"I coming." (I'm going but will be right back.) "I coming to go." (I'm about to leave now.) "Go come." (Come back later, or Hurry back.) "I come to you-o!" (I'm here to ask you for a favor.)
come let's each rice!	a customary invitation to join in eating. Liberians will always extend this invitation regardless of the size of the group or the quantity of food. If one has already eaten or otherwise does not wish to partake, he or she says, "Thank you" which means "no thank you." Or, in order not to offend those who extended the invitation, the invited person may eat one token spoonful of the food and then say "thank you."
congo	A term originally applied to "recaptured" Africans--those slaves rescued from slaveships during the period of the British and American blockade of the West African coast early in the 19th century, and released at Freetown or Monrovia. In that many of these recaptured people were from the Congo region, this word became a general reference to such persons, who were destitute, defranchised, and helpless. During the early years of the Liberian colony, large numbers of refugees of this kind constituted a serious problem to the government. For the most part, they developed into a class of uneducated laborers and tenant farmers, looked down upon by colonists and high-status tribesmen alike. Except in some rural areas, their descendants today are indistinguishable from other members of the coastal urban population, and many leading Liberian citizens have "Congo" family backgrounds. In many sections of the country the term still has derogatory implications--both as an epithet and as a snobbish class distinction. (d'A.)
country	tribal or traditional, referring to native or indigenous customs. "country doctor" (a herbalist or bonesetter) "That big shot got three country wives." (Besides his 'civilized' wife he has some other wives for whom he may have paid dowries in the traditional manner.)

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cut	to break or tear. "The rope cut!" (The string broke.)
cutlass	machete. One of the most general and important implements in the interior. (d'A.)
cut throat	to gain by outwitting a rival. "I was loving that girl but my best friend cut my throat." (He won her away from me.) "That man going so cut my throat for the job in the Ministry." (That man over there did something so that the people hired him instead of me.)
dash	a tip or gift; to give something to someone in return for a favor. "Dash" does not imply anything like the word "bribe" (see "knock belly") but rather indicates reciprocity, recognition of a favor for service done, or the worth of the person being "dashed." In some tribal languages the term for such a token gift means, literally, "respect." It is an indication of the esteem or satisfaction one has with regard to a person who has rendered a service or who is being asked to do so. (d'A.) "Mommy, since I buy plenty fish from you, you must dash me one fish-o!" (customer to a market lady: Since I gave you a lot of business--and thus you don't have to stay as long in the market until all your fish are sold--you should give me another fish as a sign of appreciation.)
dear	expensive "Pepper too dear this time." (The price of pepper has gone up--as it usually does during the dry season.)
devil	any masked dancer or performer, whether for entertainment or ritual. Not to be confused with the Euroamerican concept of "devil," "satanic," or "evil," though this is the way the term was applied by early missionaries and other travelers to Africa. When a Liberian speaks of "devil business," he means something sacred or mysterious connected with tradition. It is still in common usage among English-speaking peoples of urban and rural Liberia, but there is an increasing avoidance of such terms by sophisticated Liberians--particularly those who are developing a renewed pride in their traditions, having had an opportunity to see them more objectively. It is best to learn the specific local names for any ritual figures and to refer to these respectfully by these names. It is also important to know that many of these figures are primarily "entertainers" and that others are considered to represent sacred spiritual entities. The boorishness of tourism is no less evident under these circumstances than if one were to refer to the Roman Catholic pope in his vestments as a "god," to the Christian crucifix as an "idol," and to sacramental wine as "booze." Conversely, it is just as naive to refer to a costumed clown or other entertainer as a "witch doctor," "priest," or "magician." (d'A.)
different-different	varied; many kinds. "The people fix different-different food at the feast." (There was a great variety of food prepared.) Repeating a particular word is a common means of intensifying its meaning.

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sassywood	a concoction made from the bark of the Erythrophlaeus guineensis. The term may be derived from the English "sauce". Used as an ingredient upon which oaths are sworn, and as an ordeal in cases of litigation. The term has come to be a general reference to all ordeals involving a potion taken internally. (d'A.)
scoobies	low-back tennis shoes
scrapehog	a pejorative term for white people
self	even (used for emphasis) "The man never came self." (He didn't even show up.) "That one self small." (Even that one is too small.) "You self you know that woman cracky." (Even you know that that woman is a bit tetched in the head.)
sister/ brother	prefaces a name as a form of address for an older brother, sister, cousin, or associate. "Brother Jacob, please give me small rice." (A person younger than Jacob is making this request.)
sit down good	This means "Squeeze over. Let one more person get in the taxi."
sizeable	physically mature. "He not pekin again, he sizeabl[illegible]." (He's no longer a child; he's a big boy/young man [illegible])
skates	high-back tennis shoes
sleep	also refers to something left out overnight. "Oh! The rice slept in the pot-o!" (Somebody forgot to put it away.) "The cassava must sleep for two-three days under the water." (Keep the cassava in the water for a few days until it ferments (for making fufu).)
slippers	rubber thongs or sandals
small	a little. "Wait small." (Hold on a minute.) "The water coming small-small." (Just a trickle.)
small boy/ small girl	a child; an inferior or unrecognized person. "You think you know this place? You small boy!" (You don't know all the ins and outs of this place and the people who work here like I do.)
so	this way/that way. "The man went so." (He went that-a-way.) "Where's the chief?" "He so." (Over there.) "Let it be so." (Enough!)
so-so	1) neither good nor bad. "How you feeling?" "So-so." 2) lots of, nothing but. "So-so bones in the soup." (Lots of bones.) "So-so red marks on my card." (Lot's of F's on my report card.)
Something	"Where my something?" (Where's the thing you said you had for me?)
sometime	perhaps. "Let go see Hawa. Sometime she having small food for us-o." (Maybe she'll have something to eat.)

Poro	the general term for the compulsory fraternal associations, known as the male secret societies, in many of the tribes of central and western Liberia, as well as in Sierra Leone, Guinea, and Ivory Coast. Each tribe has its own name for this organization. It should not be confused with many other types of secret societies which may also exist in the same region. (Compare Sande.) (d'A.)
Poro bush	the sacred grove of the men's secret society where boys are trained and initiation rites take place. (d'A.)
pregnant	(v) to make a woman pregnant. "That the boy who pregnant that woman daughter." (He's the one who got her daughter pregnant.)
prop	to pad one's rear end by wearing more than one pair of trousers.
punk	sodomist
raccoon	a civet
rascal	tricky, deceitful, crafty. "You see how the man can talk one thing and do different thing? He too rascal!" (He doesn't practice what he preaches.)
reach	to arrive. "What time you reach Monrovia?" (When did you get there?) to be enough. "The money can't reach-o!" (My money is insufficient.)
rice crust	the toasted rice that sticks to the sides and bottom of the pot after cooking. Highly prized by children, who stand about the fire waiting for the emptied pots. Very much the same as "pot lickin's" or "licking the bowl." (d'A.)
rogue	thief. Thievery is a major crime among most of the tribal peoples of the interior, and thieves are punished severely. The cry of "rogue, rogue, rogue" may also be heard frequently in towns and cities, where crowds will follow an apprehended thief to jail, shouting abuses and calling attention to his/her crime. (d'A.)
rope	any piece of string, strip of cloth, or a vine
Sande	the general term for the compulsory sororal associations of female secret societies, which exist among many of the tribes of Liberia as well as in Sierra Leone and Guinea. The term Bundu is also heard, but this is used mainly in Sierra Leone among the Mende people. (Compare Poro.) (d'A.)
Sande bush	the sacred grove of the women's secret society where girls are trained and secret rites of initiation take place. (d'A.)
Sapo/Sepo	a type of scouring pad made from the fibers of a gourd (sim. to excelsior)
sassy	full of energy, frolicsome. "That dog too sassy!" (a playful dog)

divide	to distribute or share. "Who divide the cards?" (Who dealt this hand?) "I must divide the rice?" (Should I go ahead and dish it out into each person's bowl?)
dobe-flesh	used clothes
dry	sickly, undernourished, skinny. "You looking dry this time." (You've lost a lot of weight.) Not a compliment.
dress	(verb) move over. "Dress small, old lady." (Move over so one more person can squeeze into the taxi or pickup.) (This particular expression is not a comment on the woman's attire!)
dumboy	boiled cassava pounded into a thick, viscous dough, served in a bowl covered with soup, or squeezed into a ball and dipped into the soup. (d'A.) (Compare fufu and gegbe.)
ease oneself	to urinate or to defecate. "Teacher, I want go ease myself."
eat	besides the usual meaning, this word also means to embezzle. "The tailor ate my change-o!" (The tailor didn't give me my change.) "The carpenter ate the balance zinc from me." (He kept the rest of the roofing material—which I had bought—for himself.)
eddoe	the tuber of the Colocasia esculenta or Xanthosoma sagittifolium. Known elsewhere as cocoyam or taro. It is cultivated and eaten in Liberia as a "potato." (d'A.)
embarrass	to inconvenience; to be an obstacle to. (This is one of the early Middle English meanings of this word.) "Those children outside are embarrassing us, teacher." (They're probably making too much noise so that the students can't hear their teacher.) "That chair embarrassing the door. Move it!" (It's in the way.)
ene?	Is that so? Probably contracted from "Ain't it so?"
ever since	Some time ago; already. "I wash the clothes ever since." (I've already gotten that task out of the way.) "That girl been in the city ever since." (She's been living in Monrovia for a long time now.)
except	unless. "You will not get your check on time except you run behind it." (You yourself have to see that all the papers get processed if you want it in time.)
fine	satisfactory, good, beautiful. "That woman fine-o!" (She's very pretty.) "I see you fix your new room fine!" (You've done a good job painting and decorating it.)
fine time	having fine time: often implies lovemaking. "My girl and I were in the room having fine time."

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finish	to run out; to have completed a task; to be broken; to be completely out. "The money finish." (No more money.) "My watch finish." (My watch has broken.) "I will soon finish washing my clothes." "The chair fini' breaking." (The chair has broken.) "The man fini' cheap!" (He's stingy as hell!)
flash	splash. "Oh! The pepper water flash in my eye-o!" (He/She may have just mashed a boiled pepper and got a squirt in the eye.)
foot	the whole leg. "He left small to broke my foot!" (He almost broke my leg.)
for true?	Is that right? "The President coming here next week." "Oh, for true?" really, actually, a fact. "The man sick for true." (You're right, he's really sick.)
for what?	why? (often said with a peremptory tone of voice) "I coming to beat you-o!" "For what?" (Don't kid yourself.)
fresh cold	a common cold, no matter how long one has had it. "Fresh cold giving me hard time." (I've had this cold for some time now.)
fresh milk	canned milk. "Please give me one tin fresh milk."
frisky	impertinent, insolent (does not mean frolicsome). "That small boy too frisky!" (He's not behaving properly in the presence of elders or other social superiors.)
fuck	not the powerful obscenity it is in the U.S. It's common to hear respectable people in seemingly polite situations say, "He fuck up!" meaning things did not work out as he had planned. This word is often spelled "fork" on walls, school desks, and in buses.
fufu	a thick dough made from cassava that has been grated or beaten and fermented. After being cooked, it is rolled into a ball and covered with a soup. It is swallowed without being chewed. (d'A.) (Compare dumboy and gegba.)
full	(adj) ripe. "The rice not full yet." (It'll be another couple of weeks until it s ready to be harvested.) high. "The wate full-o!" (The rivers and swamps are high.) (v) to fill up. "Full my glass."
gari	coarsely powdered cassava that has been grated, dried, and toasted. It can be eaten with sugar and milk or rehydrated and served with a soup or sauce—as rice is served. Also called farina.
gbasa jamba	cassava leaf (in the Vai language)—particularly a sauce made of the leaves from the cassava plant, which have been beaten in a mortar, cooked with fish, meat, or chicken, red palm oil, pepper, and other ingredients such as beans, okra, or other greens. Served over rice. Sweet-o!

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overplus	excessive. "Time we went to the feast we ate overplus." (When we went to the festival, we stuffed ourselves.)
own	worth. "How much groundpea you want?" "I want ten cent own." one's portion. "Gimme my own of rice." real, actual. "That my own pa." (That's my real father, not my guardian.)
palaver	discussion, argument, trouble (derived from the Spanish word palabra, word) (d'A.)
palm butter	The thick, oily gravy strained from the pounded pulp of the palm fruit ("palm nut"). When mixed with pepper and meat, it makes a much relished "soup" to serve on rice. (d'A.)
palm oil	a bright to dark red-orange oil extracted from palm nuts (fruit), used extensively in cooking. It can be "clarified" by heating.
palm wine	The sweet sap of the raffia and oil palms, collected from a cavity cut into the heart of the tree. The sweet—and lightly fermented—sap is called "woman's palm wine." The more sour—and more strongly fermented one is called "the man's own." The fermentation occurs by natural yeasts. (d'A.)
part	that which belongs to somebody. "Is this my part of rice?" (Is this the rice you reserved for me?) "You part, you full of foolishness." (As for you, your full of foolishness.)(In this context, usually said in jest.)
pass water	to urinate
past	to a greater degree than. "That man big past me." (He's taller or larger in size than I.) "This food sweet past the other one." (This food is more delicious than that.) "That lock small past my own." (That padlock is smaller than the one I have.)
peepee/piss	to urinate (commonly used and inoffensive) "I coming. I want go peepee." (could be said by anybody from a small child to a grown man—or woman)
pekin	small child or young adolescent boy
pellie	good friend, one with whom one has had some pleasant experiences. "I know the Boima too well. That my pellie." (I know the Boima you're talking about. He's one of my best friends.) "Pellie, let's go walkabout!" (Let's take a stroll around town and see what's going on.)
plenty	a lot; many; much. "Plenty pepper inside!" (The food's hot!) "The women plenty in that town." (Lot's of women there.)
poo-poo	excrement; act of defecation. "So-so poo-poo on the road!" (Many people have been relieving themselves at the side of the road)

medicine	an object (fetish) or practice (ritual) intended to control supernatural powers for desired ends. "Somebody made medicine against me." (A frequent explanation for otherwise unexplained failure, sickness, or death.) Also called "African science." (d'A.)
meet	also means to find, to come across, to see. "When I reach, I met the people already in the meeting." "I went to your place last night but I never met you." (You weren't home.)
move	get away from. "Move from my face." (Get away from me. Probably a literal translation from an expression in the indigenous languages that means, "Get from in front of me." "Move from there!" (or "Move there!") (Get away from there—either you might disturb something or might get hurt.)
must	please(do). "My ma say you must send her ice." (My mother asks that you please send her some ice.) Should. "I must come?" (Should I come?)
myself	me, too/ me, neither. "My friend can't eat black deer. Myself." (I don't eat it either.)
no mind, yah!	an expression of condolence suitable for soothing a crying child, sympathizing with somebody who has been injured, or comforting a bereaved person.
nothing strange no bad news	a response to the questions, "What news?" or "How you keeping?"
now	(adv) just. "The chief now come." (He has just arrived.) "I now eat the whole thing!" (I just got through eating all of it.)
nut	also means penis (not testicles)
-o!	used at the end of a statement for emphasis (where Americans would indicate emphasis by giving additional stress to the particular word, a practice that might alter the meaning of the word for language-tone-sensitive Liberians), also, "To be warned!" (T. [illegible]) "The teacher coming-o!" (Better stop comparing answers.) "I don't go for it-o!" (I don't like what you're doing, i.e., keep your hands to yourself.)
on/off	(v) "On the light." (Please flip the switch.)
old man old woman	address of respect for older--and not so old--persons. "Old Man Varney, morning-o!" (greeting the gentleman)
one-one	a little bit; small-small. "I can hear Bassa one-one." one by one. "One-one person can see the doctor-o!" (The doctor sees patients individually.)
one time	at once; right away. "You must clean the fish one time." (Does not imply number of times.)

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gogba	a thick, viscous cassava dough similar to dumboy but much harder. Small pieces are twisted off a larger ball with the fingers, dipped in soup, and swallowed without chewing. A favorite of the Mano and Gio tribes. (Compare dumboy and fufu.)
go back	also refers to the death of an infant or very young child. "My wife deliver eight babies but four went back." (My wife has had eight children but four of them died before they were two years old.) This expression reflects the common belief that one's soul is waiting somewhere with other souls for the chance to get into the world by way of a new pregnancy. If the particular body that the soul has entered doesn't make it in the world, the soul returns to the waiting place for another chance.
gogbo/gorgbor	the last few drops of liquor in the gourd or bottle. He who takes the gogbo must supply the next round. "Ma! Don't give me the gogbo-o!" (I'm not prepared to offer a round of drinks.)
grona	a street urchin; orphaned; irresponsible, delinquent. (Apparently from the Sierra Leone Krio meaning "grown up" and refers to children and young people without families, living untended in the city. d'A.) "When you walk downtown, you must take time for those grona boys-o!" (Watch out for your wallet/purse and wristwatch.) "Big man like that, he too grona!" (As important as he is, he is, he often acts irresponsibly.)
groundpea	peanut, groundnut (British)
half-way	part way. "Let me carry you half-way." (Since you're on your way now, let me walk with you a little bit (usually to the edge of the town).) "Come leave me half-way." (Walk with me as I set out on my journey.)
hang head	meeting, private talk. "Okay, we will hang head and let you know." (Wait outside while we talk over the problem you have brought before us.)
having	have. "I'm having only ten cents."
hear	to understand. "I can hear Kpelle one-one." (I understand a little of the Kpelle language.) "You hear?" (Do you understand what I just said to you?) This is often contracted to "Yah?"
heart lie down	to be satisfied. "The thing you talking make my heart lie down." (I feel very good about what you've said.)
humbug	to tease or bother. "This Peace Corps man been humbugging me all night, officer!" (Avoid such a situation.) inconvenience, trouble. "Plenty humbug here." (Things are not working smoothly.)

in front	ahead, beyond; "Go in front." (Go ahead of me--I'll be along in just a minute.)
I say...!	Listen! Do you hear me? common preface to a question, a pronouncement, or a request for attention. "I say,...who working here?" (Who's going to wait on me in this store?)
jina	spirits. Widely used among Liberians to refer to any natural spirit or supernatural entity. Apparently derived from the Arabic jinn. Also refers to familial or guardian spirits. (d'A.)
juke	poke, puncture; ruin somebody's (perhaps illegitimate) chances. "She juke inside the snake hole with a long stick." "That woman husband really juke me for that job-o!" (He interferred with my making a deal with someone to get the job.)
just now	right away. "I coming just now." "That just now I come-o!" (I just got here.)
keke	a malnourished, flea-bitten puppy or dog
kitchen	any roofed-over, but open structure used for cooking or for meetings and receiving visitors. (d'A.) or for ~~[illegible]~~ purposes
knock belly	a colloquialism for doing a favor or giving a gift as an inducement for a requested service (i.e., a bribe) (d'A.) "You want me to fix your check before time? You must knock my belly-o!" (Cough up.)
kola nut	the nut of the Cola nitida and other species of kola tree cultivated throughout West Africa. Between five and ten nuts are clustered in the large green pod of the tree. Along with salt, gold, and slaves, the kola nut was an important part of the ancient trade between the coastal forest areas and the peoples of the high interior savannah. It is highly prized for its taste and stimulating effect. It is chewed during work and on long treks and is said to diminish appetite and increase energy. Kola nuts also have a ceremonial and ritual significance: White kola nuts are symbols of friendship and purity of intention, and are used in gift-exchange as well as in sacred ritual. A red day may also be made from kola nuts. (d'A.)
kro-kro-ji	crooked, deceitful, sneaky. "He play kro-kro-ji." (He achieved his goal by less-than-honest means.) (d'A.)
kuu	an indigenous agricultural cooperative whereby all the townspeople work one person's farm, then another, until all have been prepared or harvested.
kwi	a term widely used among tribal peoples to refer to all foreigners, or those who have come from across the sea. It includes the descendants of Liberian colonists as well as Americans and Europeans. It has also come to be applied to all "civilized" or urban people who dress and behave in a non-traditional manner. (d'A.)

lappa	a piece of cloth about two yards long. It is also a measurement of length for cloth. It is the common attire for women when wrapped about the waist and tucked in as a long skirt. (d'A.)
last time	before; the other day. "I gave it to you the last time." (I have already given it to you.)
lay	to run away; escape. The rogue grab the man watch and lay." (He was gone in a flash.)
leave	let go of. "Leave me!" (Hands off!) "Leave my hand!" (Let go of my arm.)
law	also means a taboo, or prohibition sanctioned by supernatural agencies and supported by ritual. "We can't eat black deer-o!" (It's our family taboo that we do not eat black deer.)
let it be so/ let it stay so	that's enough. Stop. (When something is being measured out, e.g., food, drink, a series of complaints, or a homework assignment.)
like that	approximately, around. "I will come to your place 4 o'clock like that." (may show up at 6 or 7 o'clock.)
load	baggage, things carried. "Who will tote my load, now?" (Who's going to give me a hand here?)
long	tall. "This man long past his brother." (He's taller than the other person he's with.)
loving to	to be a lover. "I want to be loving to you." (I'd like for you to be my girlfriend/boyfriend. Implies a sexual relationship.)
ma	a term of respect for any older woman (including one's mother). To abuse one's mother is the most powerful insult in Liberia.
make farm	the entire process of preparing a plot of land for farming, including the planting of potential crops.
make market	to sell goods (produce, dry goods, baked goods, etc.) in the market place, in front of one's house, on the road, or from a container carried around on the head. "My wife making small-small market this time to help with the food business."
manage	to be able. "How you manage to know?" (How did you find out?)
mean	(v) to wrong somebody. "Teacher Davies mean me with that grade." (He gave me a lower grade than I think I deserved.)
meat	wild game. "That the Peace Corps man meat." (That's the PCV's pet--i.e., some mammal other than a domestic one--for instance a deer or a "racoon" (civet).)

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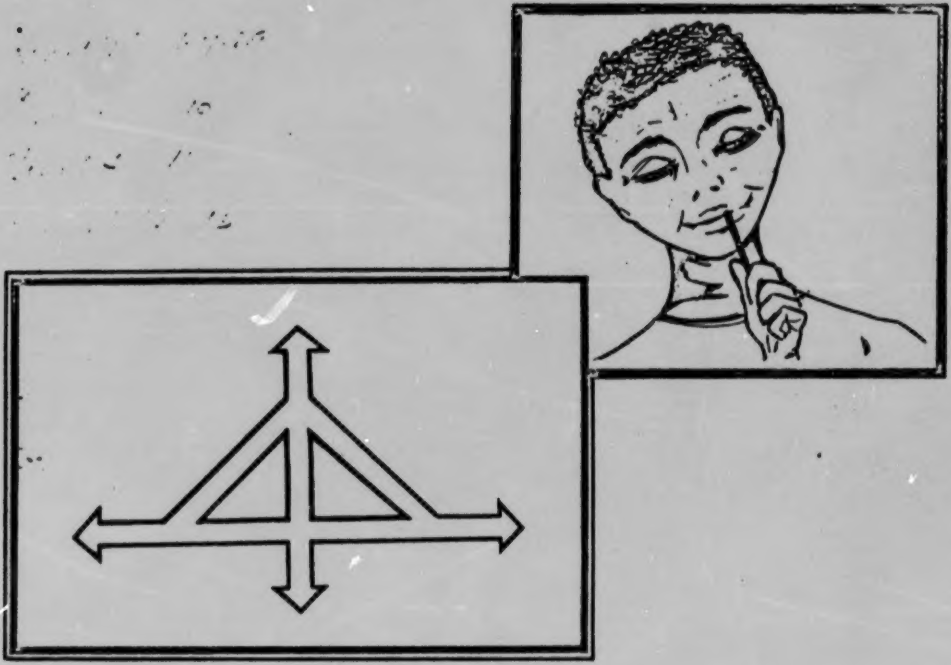

JUST A MINUTE ...
LET ME THINK!

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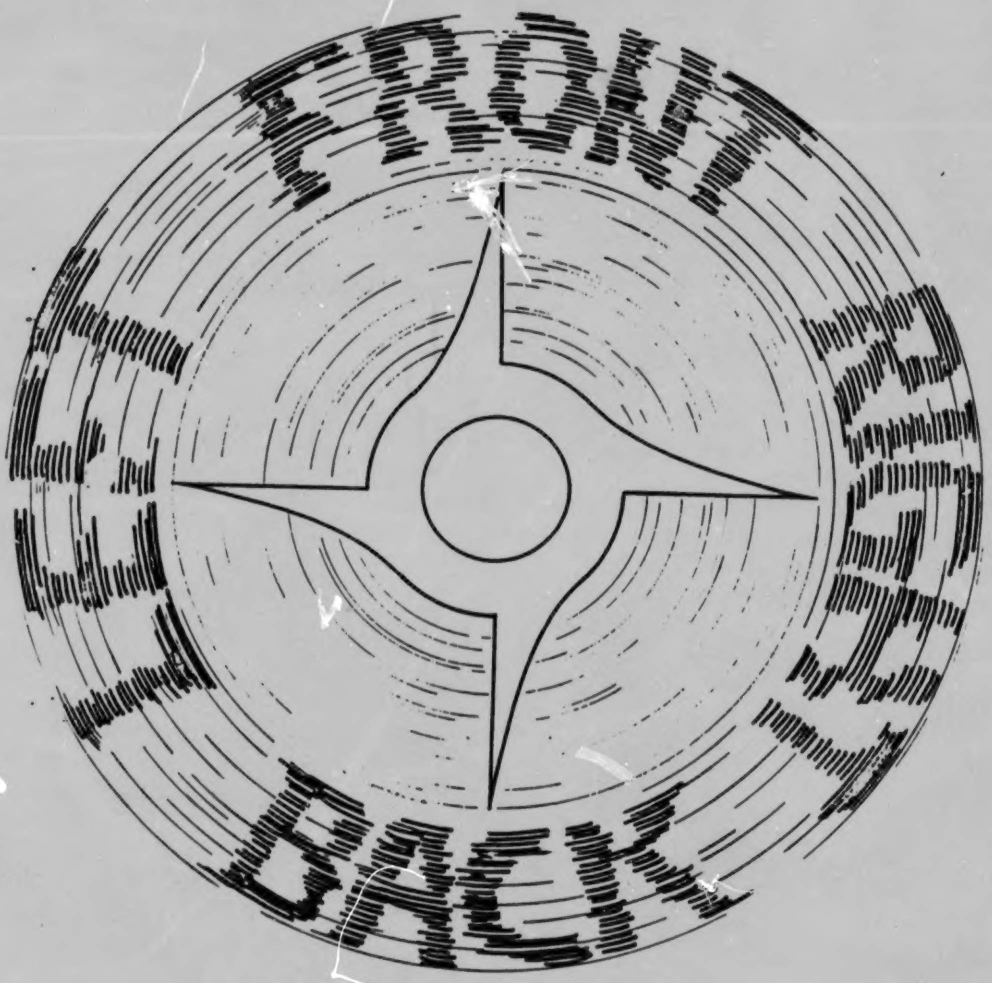

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OS
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1

Name ______________________________

RIGHT, LEFT, FRONT, BACK.

1. Write the following words several times until you complete the line.

Right ______________________________

Left ______________________________

Front ______________________________

Back ______________________________

2. Fill in the missing word:

Front, left, right, __________.

Left, front, back, __________.

Back, right, __________, left.

Right, __________, back, front.

Left, front, __________, __________.

Front, __________, __________, right.

Back, __________, __________, __________.

__________, __________, left, __________.

__________, __________, __________, front.

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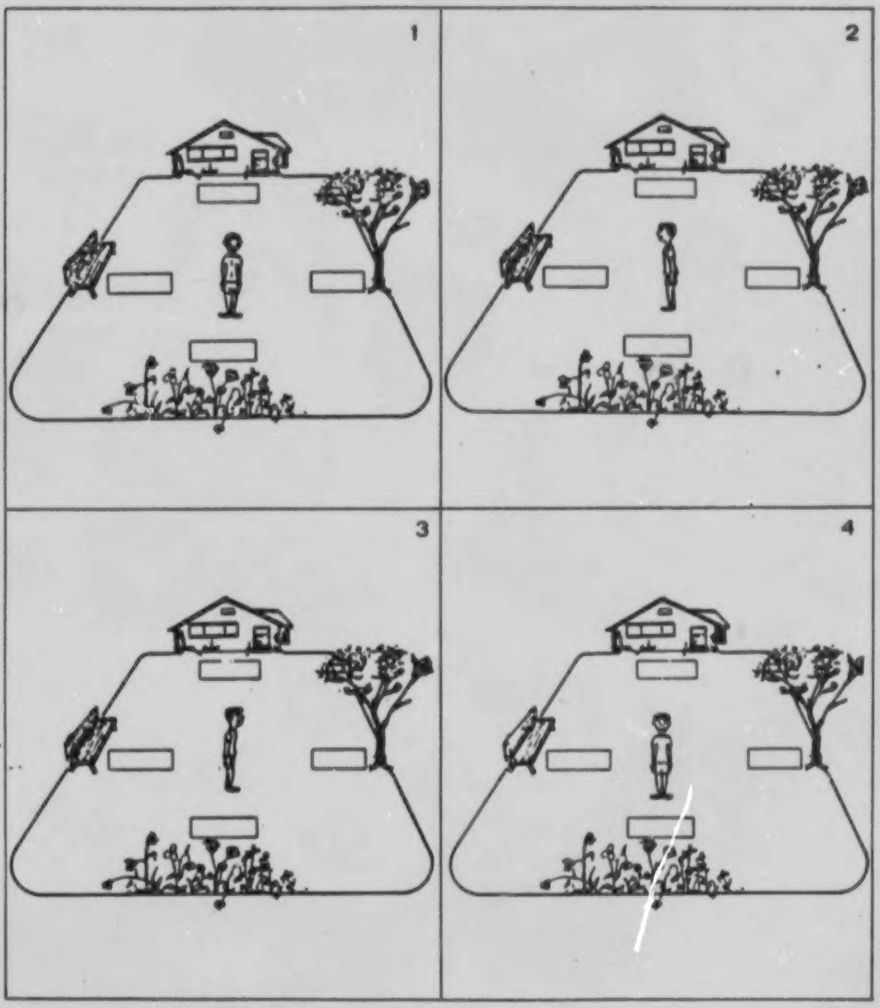

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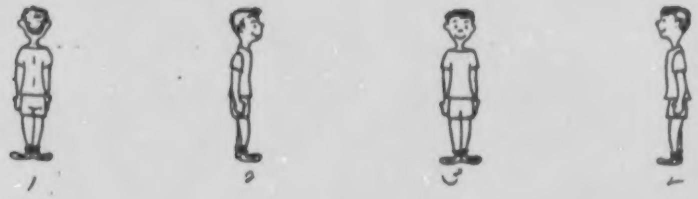

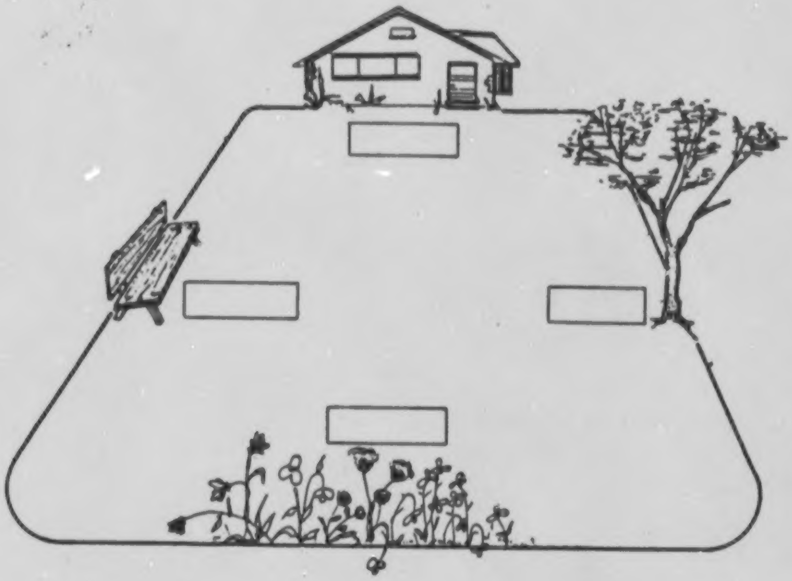

[illegible]

1. Draw or paste one of the boys in the center of the above drawing.

2. Write the directions "right," "left," "front," "back," in each rectangle according to the way the objects appear in relation to the boy you have chosen.

3. Complete the following sentences:

The bench is ______________________________.
To the left of the boy ______________________________.
The house is ______________________________.
The flowers ______________________________.
In back of the boy ______________________________.

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Name ____________________________________

The tree is ______________________________.

In front of the boy ______________________________.

The ______________ is in front of the boy and the ______________
in back of him.

If the boy turns to the right he will arrive at ______________.

If the boy goes forward, he will arrive at ______________.

To get to the bench, the boy will have to ______________.

To pick some flowers, the boy will have to ______________.

4. Write some additional sentences that describe the direction in which the objects are found in relation to the boy you have chosen.

5. Why was it impossible to know the correct direction before you placed the boy in the center of the picture?

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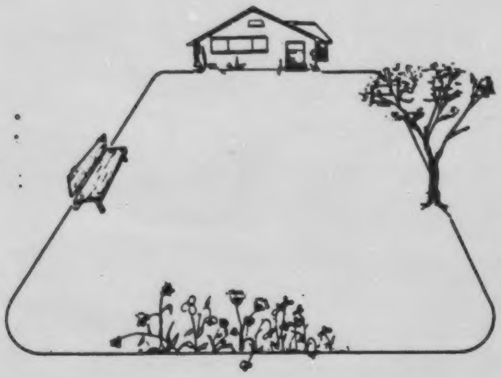

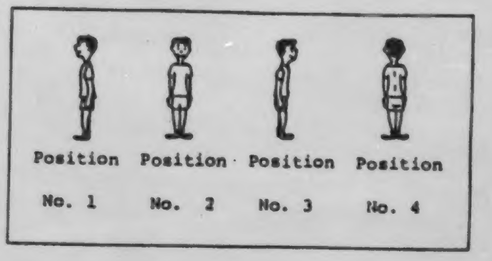

I. Where are the objects located in relation to the boy?

Position	Object	Direction in Relation to the Boy
2	The house	
3	The flowers	
1	The flowers	
4	The tree	
3	The bench	
3	The tree	
1	The house	
4	The bench	
1	The tree	
2	The flowers	
4	The house	
2	The bench	
1	The flowers	
3	The house	
2	The tree	

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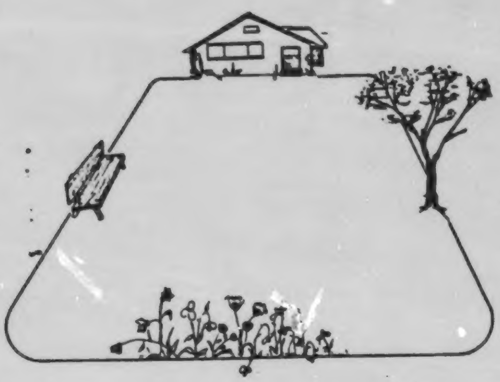
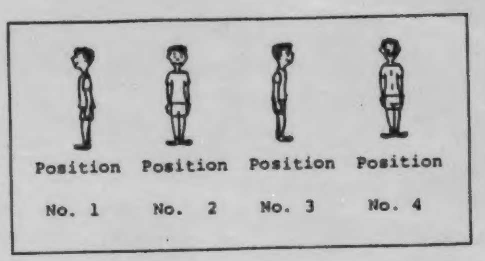
OS I 6

Name ____________________





II. What is the object?

Position	Direction in Relation to the Boy	Object
1	right	
2	front	
3	left	
4	back	
4	front	
3	back	
2	left	
1	back	
4	right	
3	right	
1	front	
2	back	
4	left	
2	right	
3	front	
1	left	

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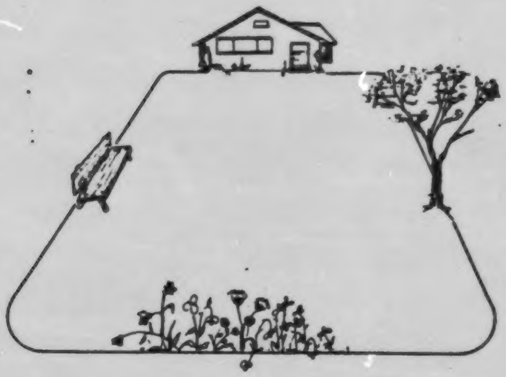

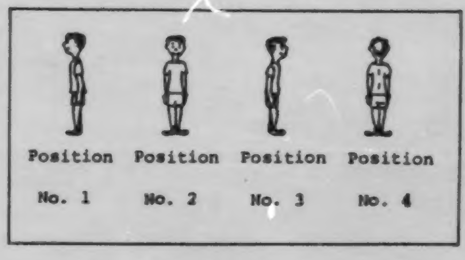

III. In which position is the boy?

Object	Position in Relation to the Boy	Position
The house	front	
The tree	left	
The bench	back	
The flowers	right	
The bench	right	
The flowers	left	
The tree	front	
The house	back	
The bench	front	
The house	right	
The flowers	back	
The tree	back	
The flowers	front	
The bench	left	
The tree	right	
The house	left	

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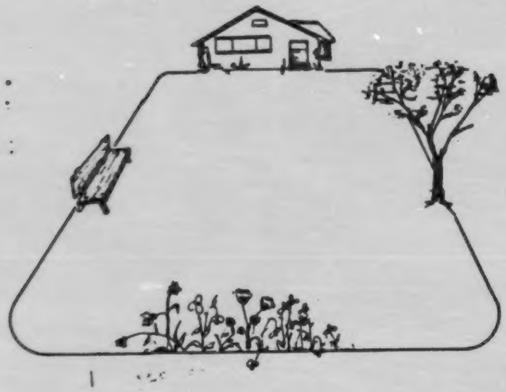

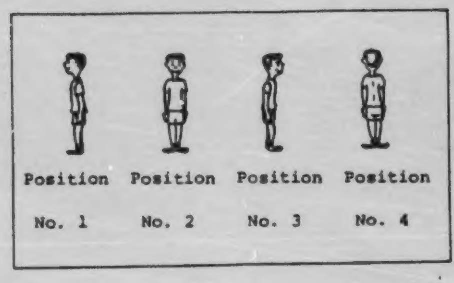

IV. Fill in what is missing:

Position	Object	Direction in Relation to the Boy
1	The tree	
4		right
2		back
	The house	front
3	The bench	
2	The house	
	The tree	left
4		back
	The bench	
		left
3		back
4	The tree	
		right

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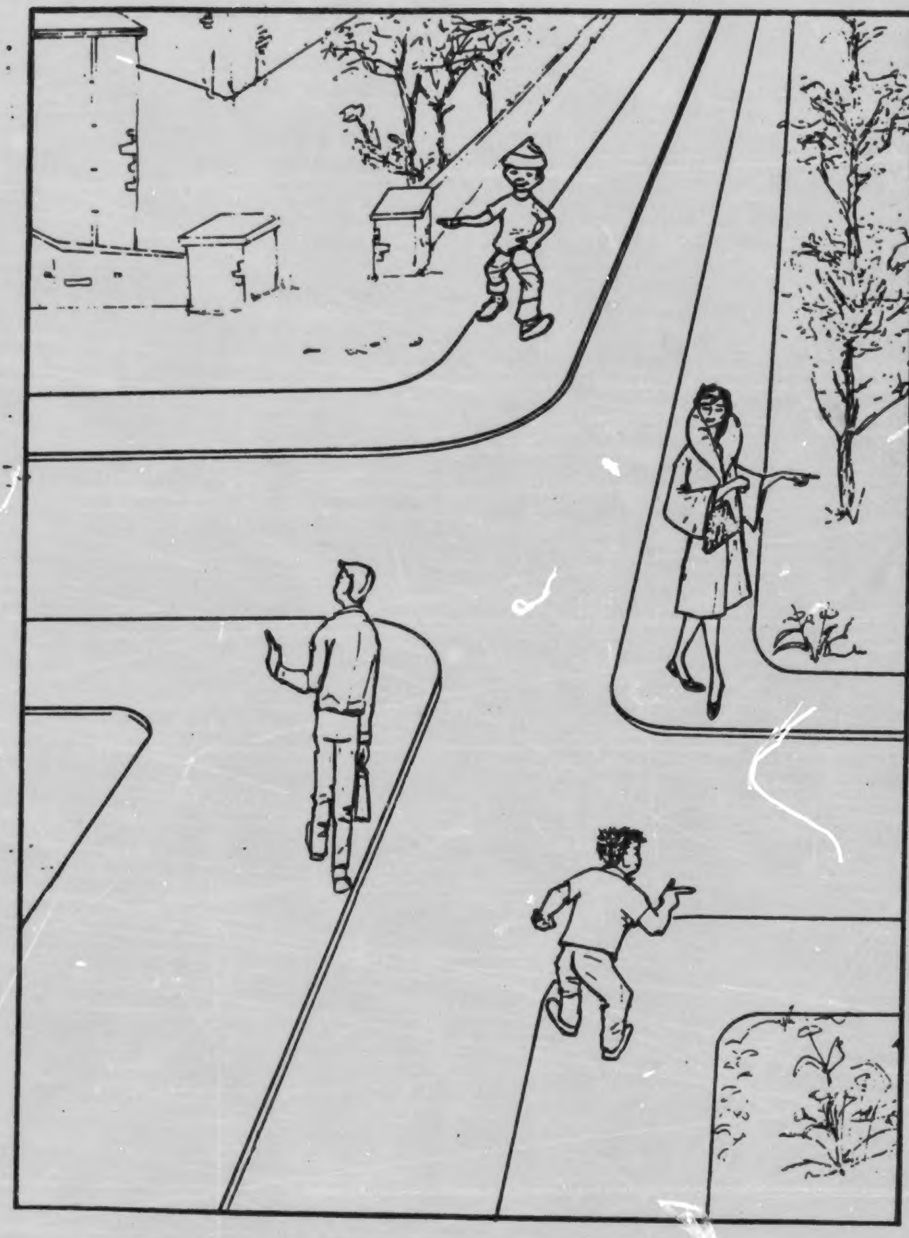
Name ______________________________



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OS
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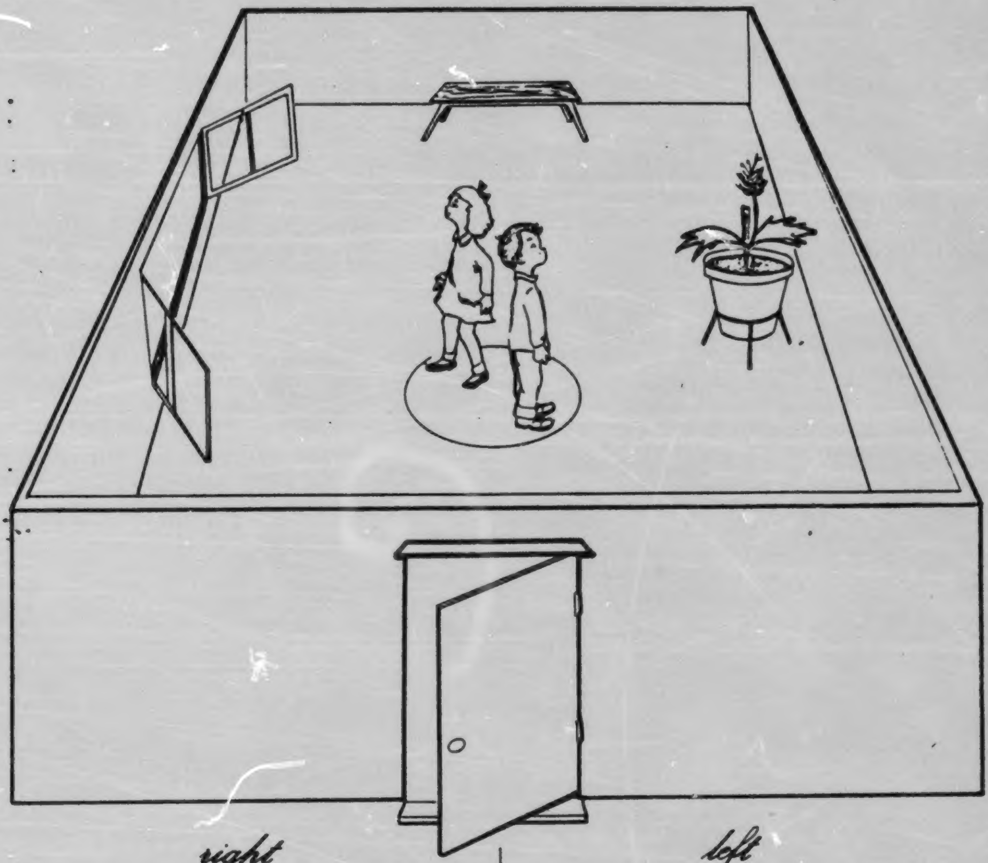
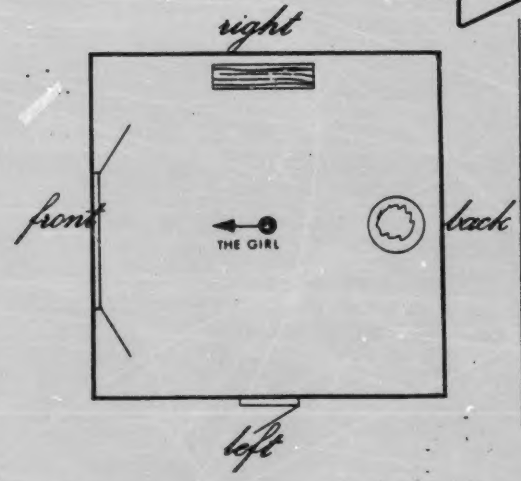
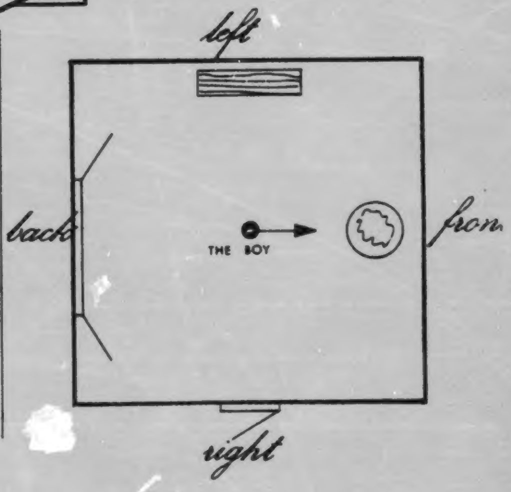
10

Name ______________________________________




right
front
THE GIRL
back
left


left
back
THE BOY
fron
right

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OS
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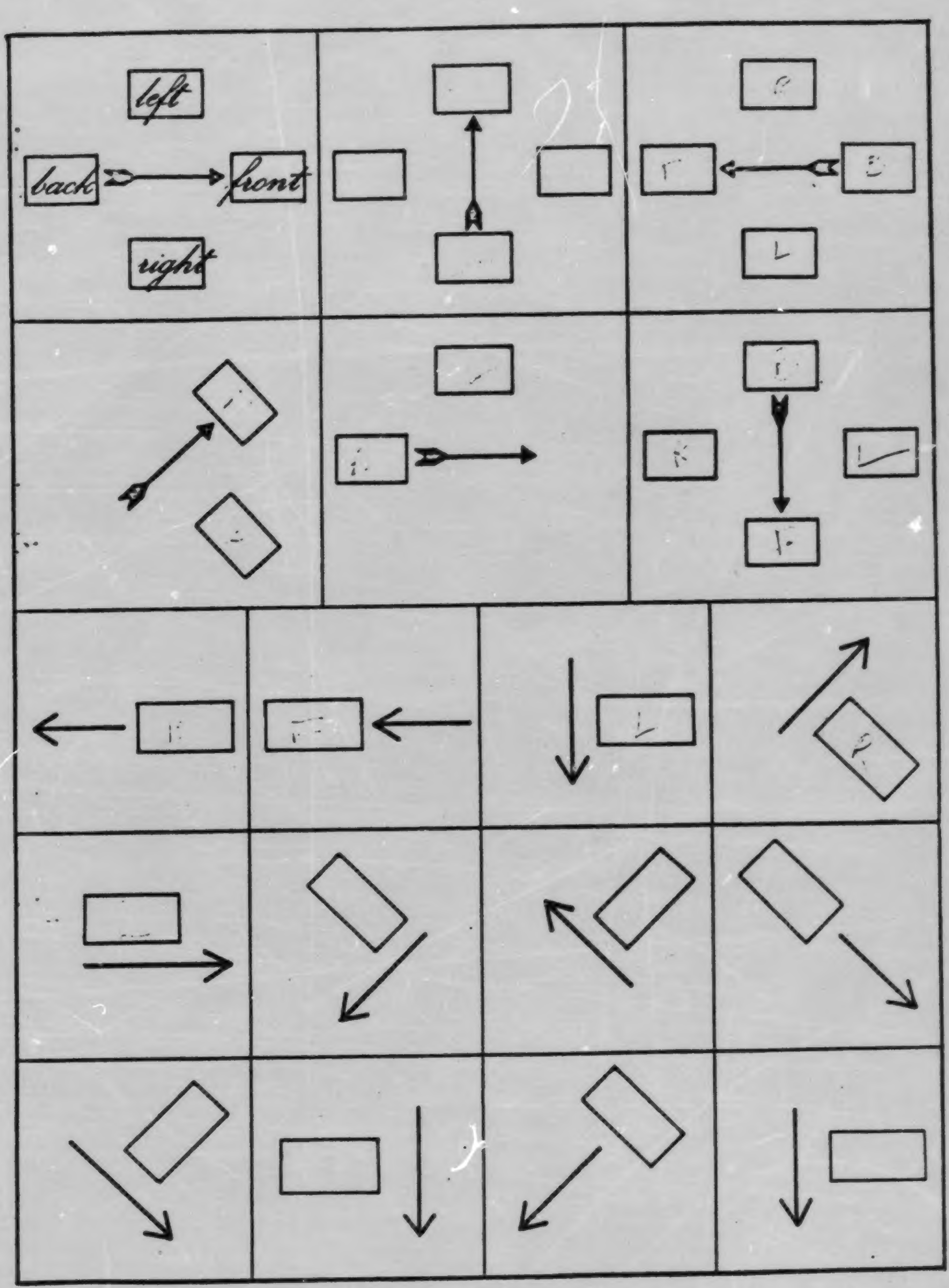
11

Name ____________________________________



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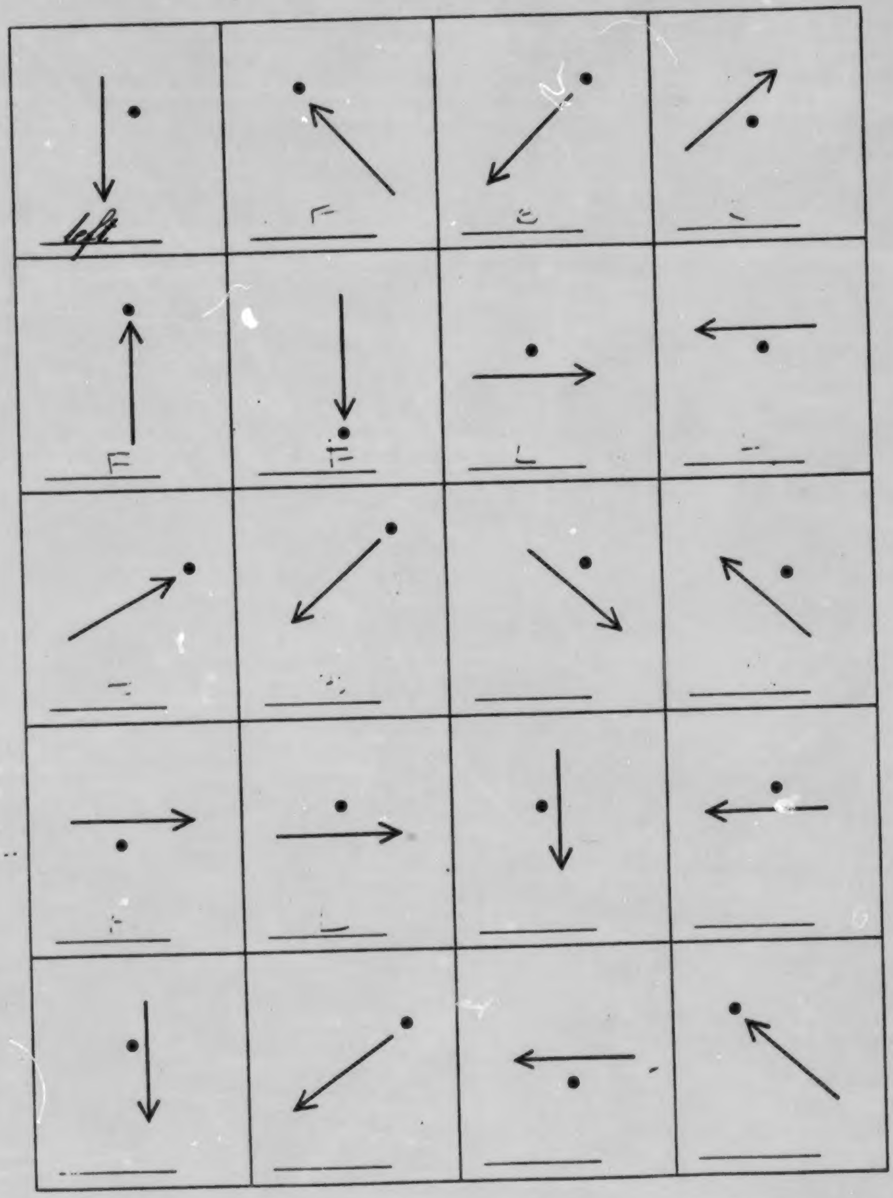
Name ____________________

Where is the dot in relation to the arrow?



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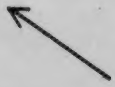
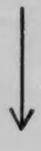
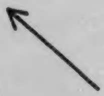
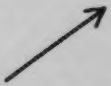
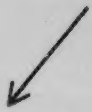
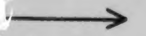
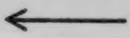
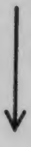
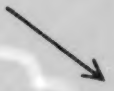
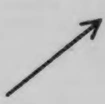
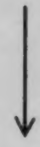
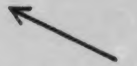
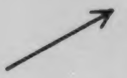
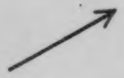
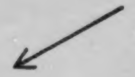
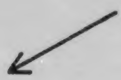
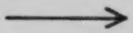
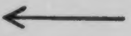
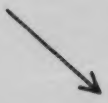
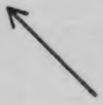
Name ____

Draw a dot so that the given direction will describe the location of the dot in relation to the arrow.

 BACK	 FRONT	 LEFT	 RIGHT
 FRONT	 RIGHT	 BACK	 LEFT
 LEFT	 FRONT	 BACK	 RIGHT
 LEFT	 RIGHT	 LEFT	 RIGHT
 RIGHT	 RIGHT	 LEFT	 LEFT

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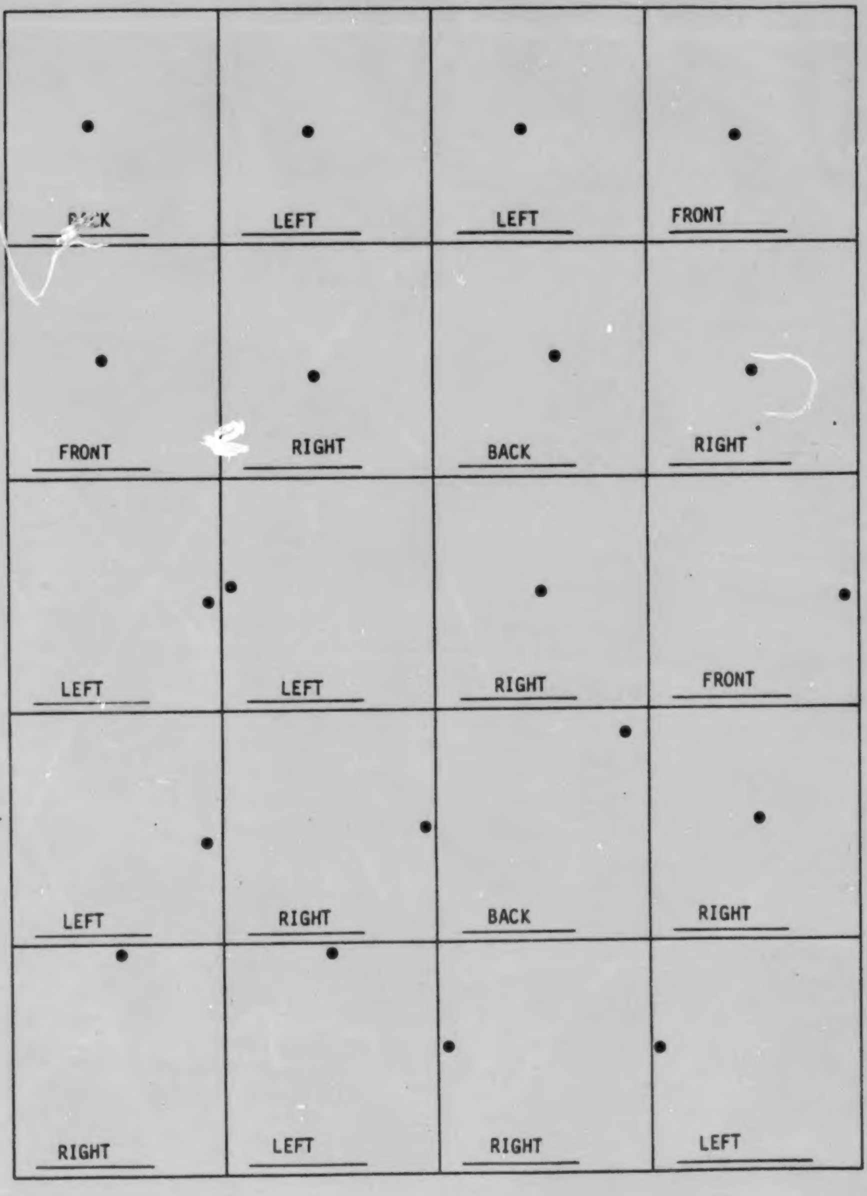
OS
I
14

Name ____

Draw an arrow so that the given direction will describe the location of the dot in relation to the arrow.


BACK
LEFT
LEFT
FRONT
FRONT
RIGHT
BACK
RIGHT
LEFT
LEFT
RIGHT
FRONT
LEFT
RIGHT
BACK
RIGHT
RIGHT
LEFT
RIGHT
LEFT

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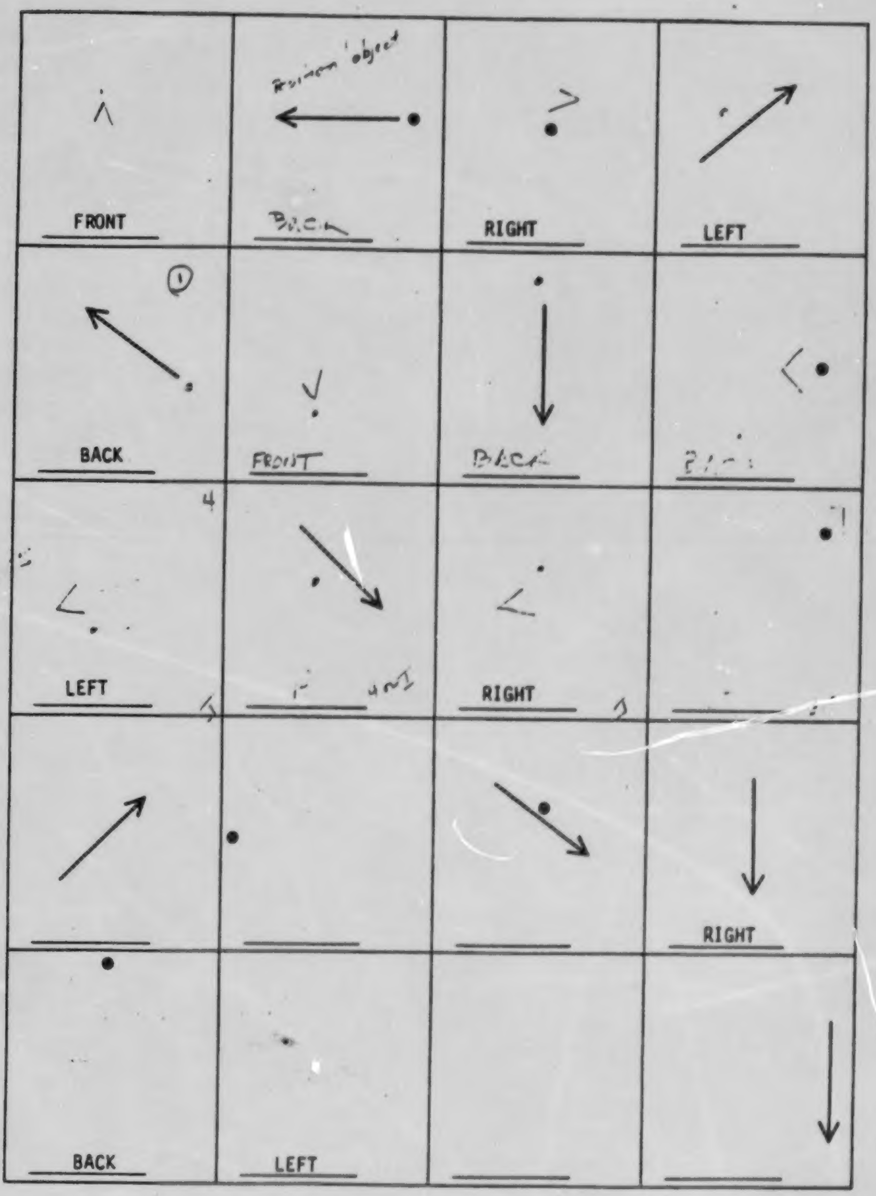
Name ____________________________________

Fill in what is missing so that each frame contains an arrow, a dot, and a word which describes the relationship of the dot to the arrow.


Position 'object'
FRONT
BACK
RIGHT
LEFT
①
BACK
FRONT
BACK
4
LEFT
RIGHT
RIGHT
BACK
LEFT

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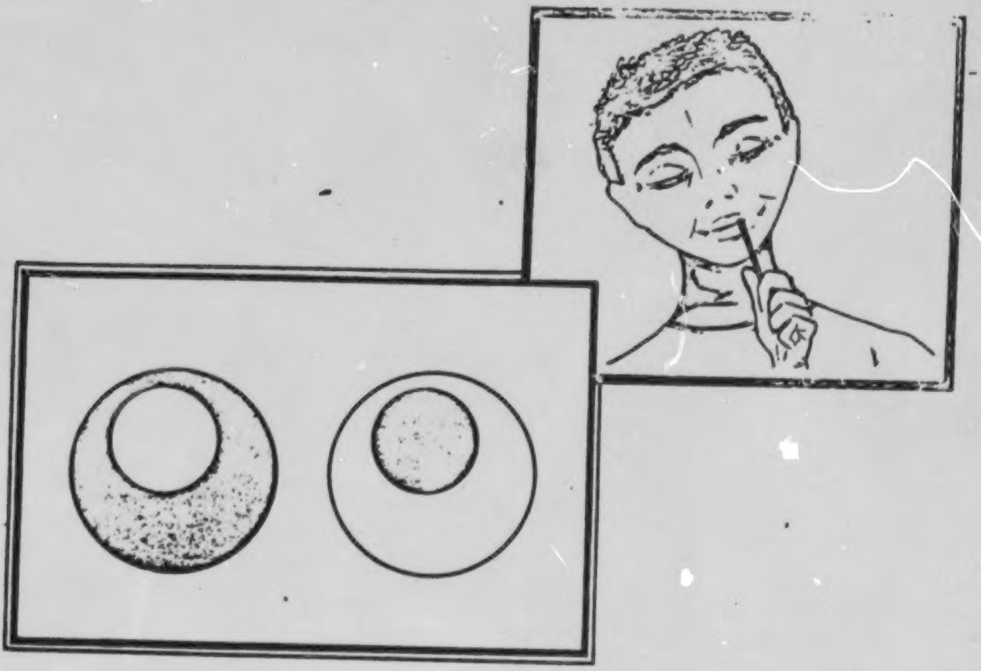
Name ____________________



JUST A MINUTE ...
LET ME THINK !

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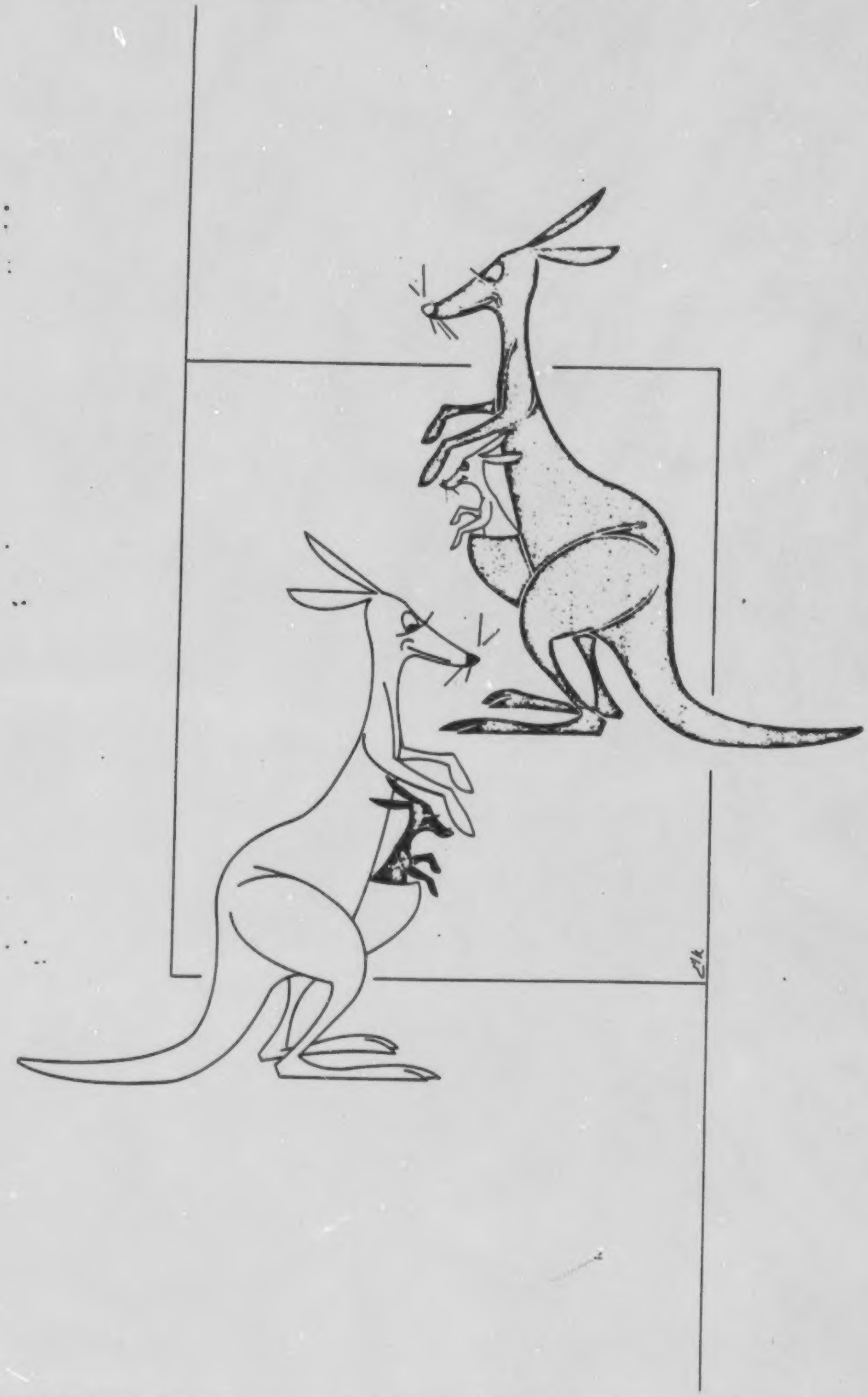
Name ____



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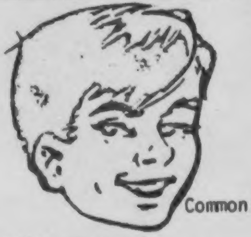
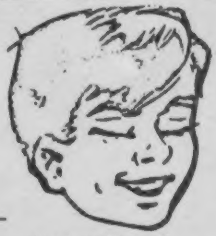
Comp

Name ____________________

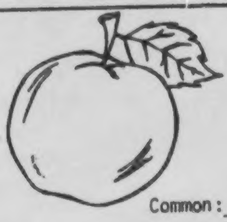
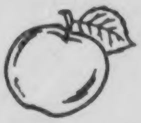
Indicate what is common to each pair of pictures and the differences between them.

Common: ____________

Different: ____________

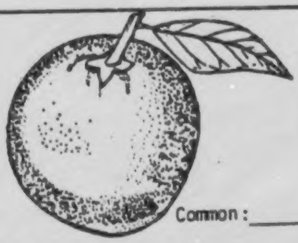
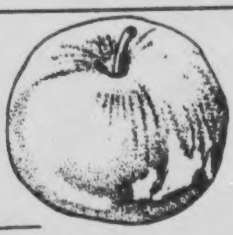
Different: ____________

Common: ____________

Different: ____________

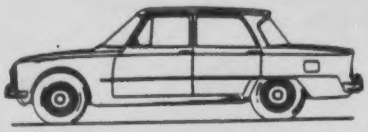
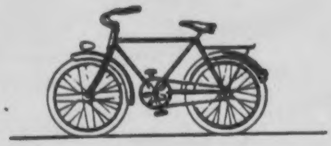
Different: ____________

Common: ____________

Different: ____________

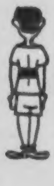
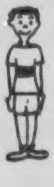
Different: ____________

Common: ____________

Different: ____________

Different: ____________

Common: ____________

Different: ____________

Different: ____________

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Com
1

Name ______________________________

Indicate what is in common to the things named by each pair of words and the differences between them.

Church Factory	} ____________	____________ ____________
Love Hate	} ____________	____________ ____________
Earring Ring	} ____________	____________ ____________
Bread Meat	} ____________	____________ ____________
Milk Coca Cola	} ____________	____________ ____________
Movie Television	} ____________	____________ ____________
Baby Old man	} ____________	____________ ____________

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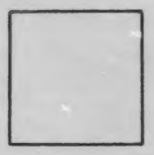
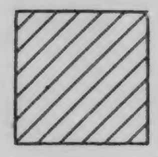
Name ____________________

Indicate what is common to each pair of pictures and the differences between them.

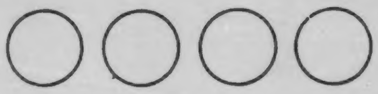


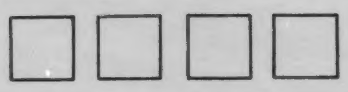


Common: ____________

Different: ____________

Different: ____________

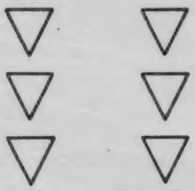


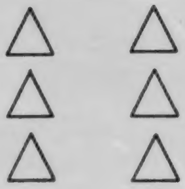


Common: ____________

Different: ____________

Different: ____________

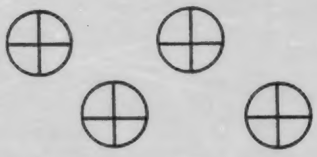


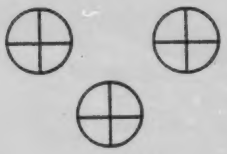


Common: ____________

Different: ____________

Different ____________

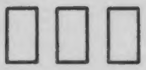


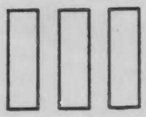


Common: ____________

Different: ____________

Different: ____________





Common: ____________

Different: ____________

Different: ____________

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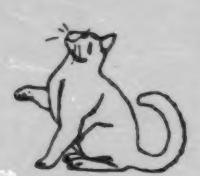
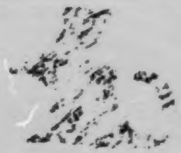
Comp 3

Name ____

Indicate what is common to each pair of pictures and the differences between them.

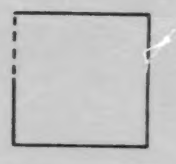


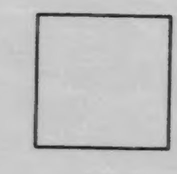


Common: ______________

Different: ______________

Different: ______________





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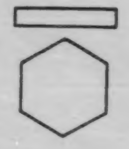
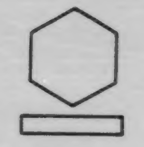
Different: ______________





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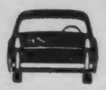

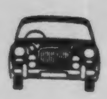

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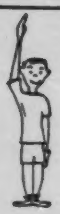

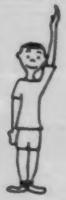

Common: ______________

Different: ______________

Different: ______________

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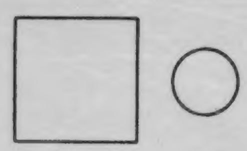
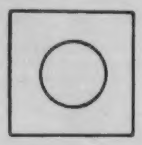
Name ______________________________

Indicate what is common to each pair of pictures and the differences between them.





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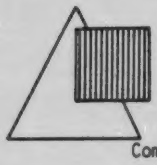

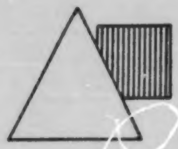

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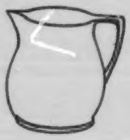

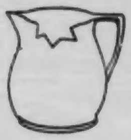

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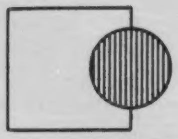

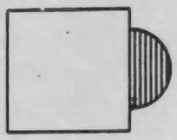

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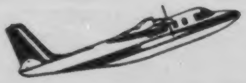

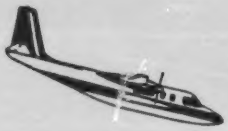

Common: __________

Different: __________

Different: __________

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Comp 5

Name ______________________________

Indicate what is in common to what each pair of words names and the differences between them.

Milk Salt	____________	____________ ____________
Sun Lamp	____________	____________ ____________
Ugly Wicked	____________	____________ ____________
Newspaper Magazine	____________	____________ ____________
Swimming pool Ocean	____________	____________ ____________
Lake River	____________	____________ ____________
Father Mother	____________	____________ ____________

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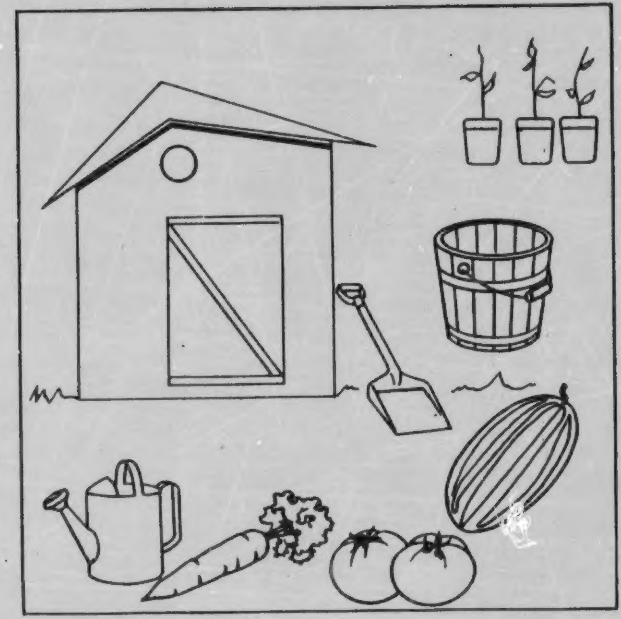
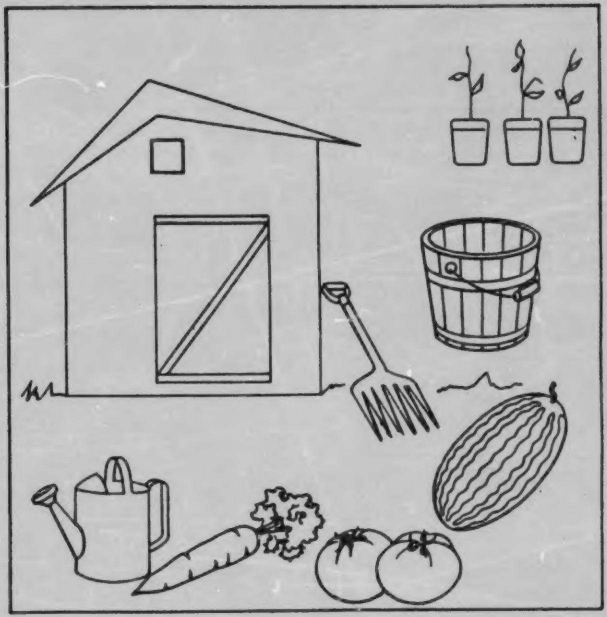
Comp 7

Name

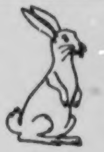
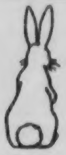
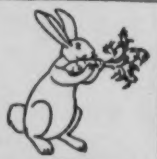
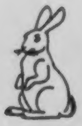
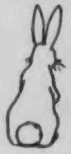
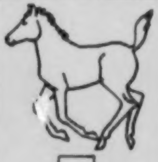
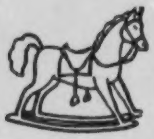
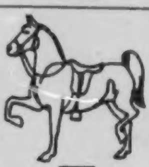
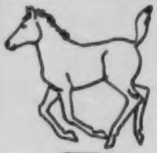
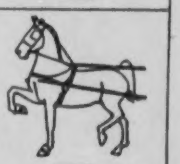
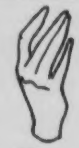
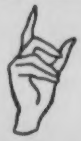
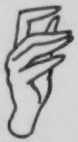
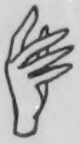
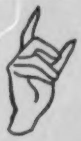
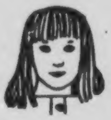
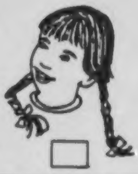
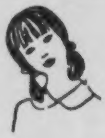
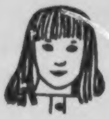
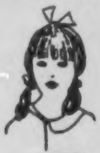
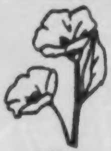
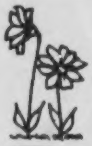
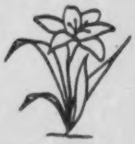
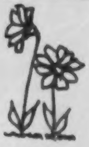
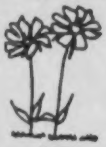
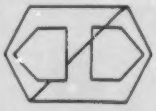
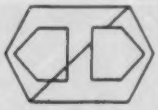
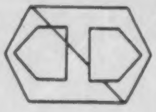
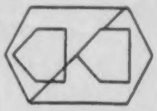
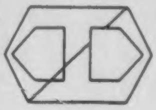
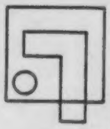
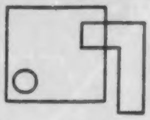
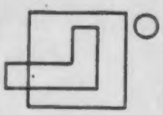
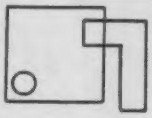
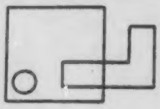




There are five differences between the two pictures. Mark each difference you find with an X.

Name ____

Place an X beneath the two pictures which are identical in each row.

 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐

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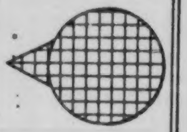
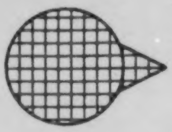
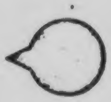
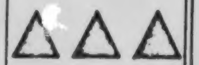
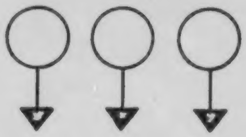
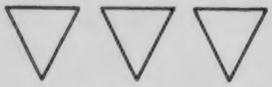
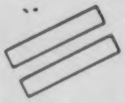
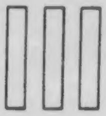
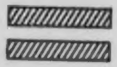
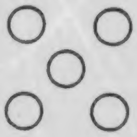
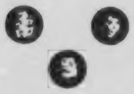
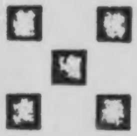
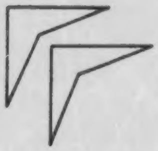
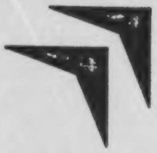
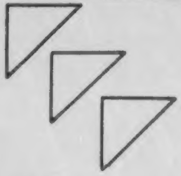
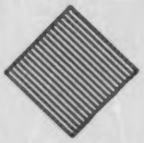
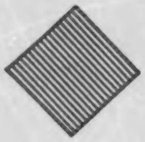
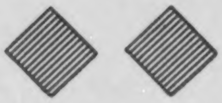
Comp 8

Name. ________________________________

Circle the word or words that describe what is common between the sample picture on the left and each of the pictures in the same row.

Sample Picture		
	 direction size color form	 direction size color form
	 number color form	 number color form
	 number direction color form	 number direction color form
	 number color size form	 number color size form
	 direction number color size form	 direction number color size form
	 direction number size color form	 direction number size color form

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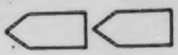
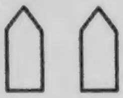
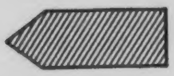
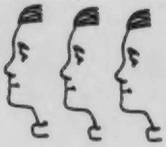
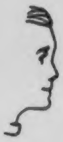
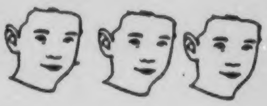
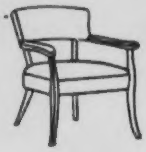
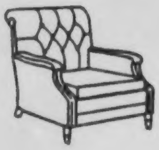
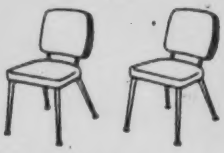
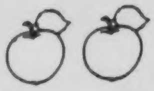
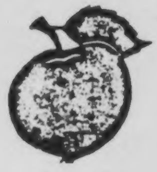
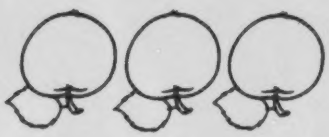
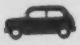
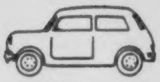
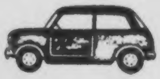
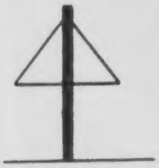
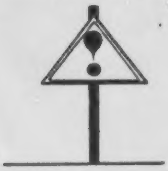
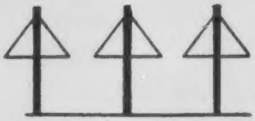
Comp 9

Name ____

Circle the word or words that describe what is different between the sample picture on the left and the two pictures in the same row.

Sample Picture		
	 direction number color size form	 direction number color size form
	 direction number size	 direction number size
	 direction number form	 direction number form
	 direction number color form size	 direction number color form size
	 direction number color form	 direction number color form
	 direction number size	 direction number size

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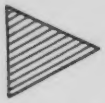
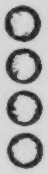
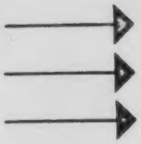
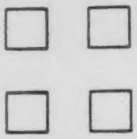
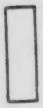
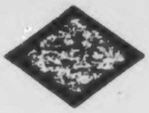
Comp 10

Name ____

Look at the sample. In each of the two frames, make a drawing that is the same as the sample only in those aspects indicated by the encircled words.

Sample	Picture 1	Picture 2
	number color [✓ size] [✓ form]	[✓ number] color size [✓ form]
	[✓ number] [✓ color] size form	number color [✓ size] [✓ form]
	direction [✓ number] size [✓ form]	direction number size form
	color [✓ number] size [✓ form]	[✓ color] [✓ number] size form
	direction number color size [✓ form]	direction number color size form
	number color [✓ size] [✓ form]	[✓ number] [✓ color] size [✓ form]

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Name ____

In each of the following exercises, you are given the similarity and differences. Fill in what is missing so that your answers are described by the given information.

______ ______	}	citrus fruits	yellow orange
______ ______	}	paper products	for reading for writing
______ ______	}	in the classroom	studies teaches
______ ______	}	vehicles	on water in the air
______ ______	}	numbers	a multiple of 3 not a multiple of 3
______ ______	}	cities in North America	on the West Coast on the East Coast

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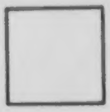
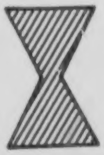
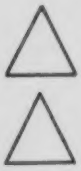
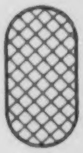
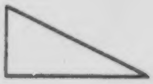
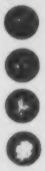
Name ____

Look at the sample. In each of the two frames, make a drawing that is different from the sample in those aspects indicated by the encircled words.

Sample	Picture 1	Picture 2
	size form [✓ number] color	[✓ size] form number [✓ color]
	number [✓ size] [✓ form] direction	number size [✓ form] [✓ direction]
	size [✓ form] color [✓ number]	[✓ size] form [✓ color] [✓ number]
	[✓ color] number [✓ size] form	[✓ color] [✓ number] [✓ size] [✓ form]
	[✓ size] [✓ direction] form number color	[✓ size] direction form number [✓ colo
	[✓ number] [✓ color] [✓ size] form	number color [✓ size] [✓ form]

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Name ______________________________________

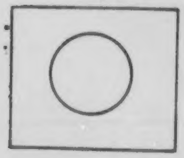
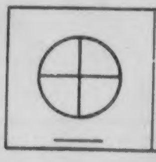
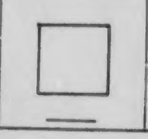
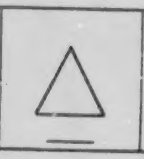
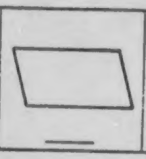
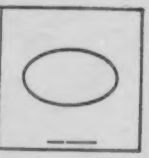
Mark a + under the two pictures which are most like the sample. 15

Write the numbers of the pictures you chose, and explain the basis on which you made your choice.

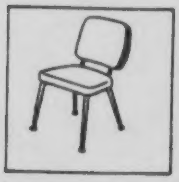
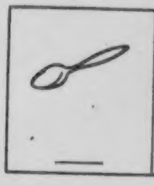
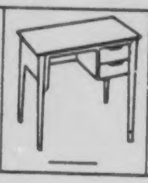
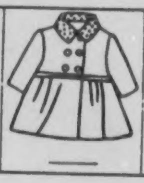
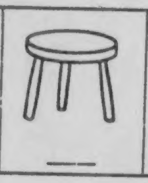
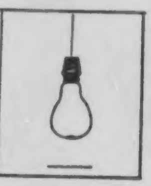
The following words will help you to categorize the pictures:

furniture	curved forms	drinking utensils
shoes	tools	five-angled forms

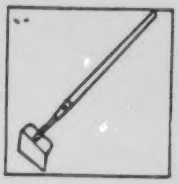
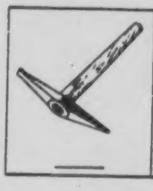
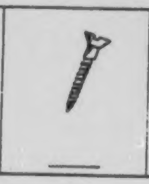
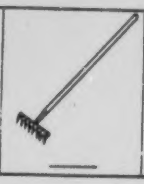
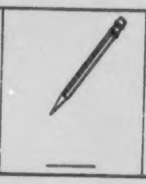
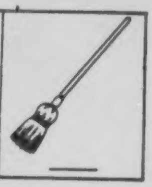
Sample 1 2 3 4 5

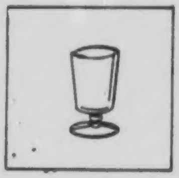
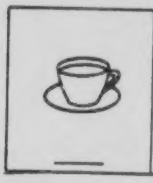
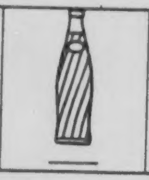
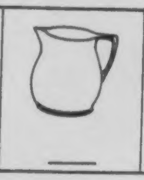
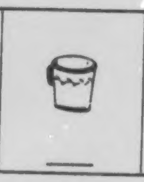
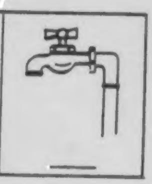
I have chosen numbers 1 & 5 because they are also ______________

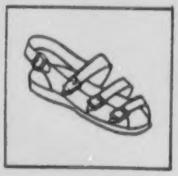
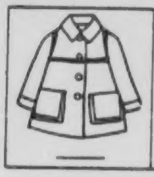
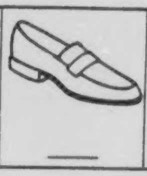
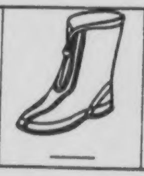
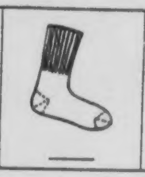
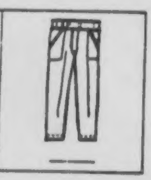
I have chosen numbers ___&___ because they are also ______________

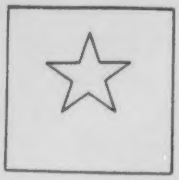
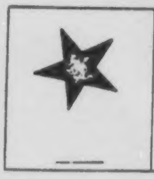
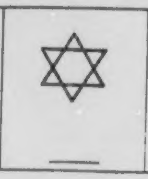
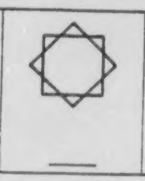
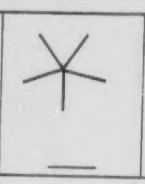
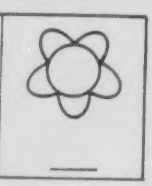
I have chosen numbers ___&___ because they are also ______________

I have chosen numbers ___&___ because they are also ______________

I have chosen numbers ___&___ because they are also ______________

I have chosen numbers ___&___ because they are also ______________

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Name ____

Choose two words that belong to the same group as the word on the left. Write the numbers of the words you choose and justify your answers.

The following words will help you justify your choice:

vocations	verbs
vehicles	geometrical figures
adjectives	feelings
musical instruments	

<table>
<tr><th></th><th>Word</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>Example</td><td>Tailoring</td><td>Laugh</td><td>Engineering</td><td>Sleep</td><td>Food</td><td>Carpentry</td></tr>
<tr><td></td><td colspan="6">I chose words 2 and 5 because they are also vocations.</td></tr>
<tr><td></td><td>Piano</td><td>Flute</td><td>Dance</td><td>Violin</td><td>Picture</td><td>Sound</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
<tr><td></td><td>Diamond</td><td>Compass</td><td>Paper</td><td>Saw</td><td>Square</td><td>Trapezium</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
<tr><td></td><td>Motorcycle</td><td>Speed</td><td>Boat</td><td>Helmet</td><td>Airplane</td><td>Wheel</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
<tr><td></td><td>Jealousy</td><td>Sweet</td><td>Driving</td><td>Love</td><td>Hate</td><td>Reading</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
<tr><td></td><td>Wise</td><td>Pretty</td><td>Cupboard</td><td>Tall</td><td>Shelf</td><td>Inch</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
<tr><td></td><td>He wrote</td><td>I chose</td><td>Pencil</td><td>Blackboard</td><td>They ask</td><td>Questions</td></tr>
<tr><td></td><td colspan="6">I chose words __ and __ because they are also ________________.</td></tr>
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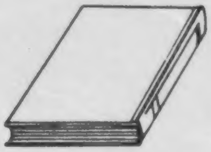
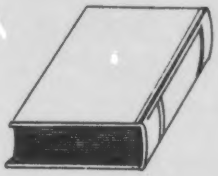
Name ______________________________

In one word, indicate what is common to both pictures.
Choose one word to describe the difference between them.

1

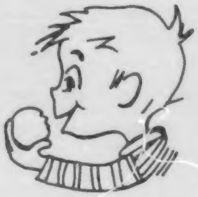


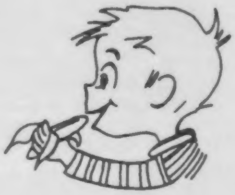


Common: ____________

Different: ____________

2

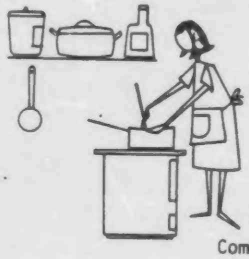


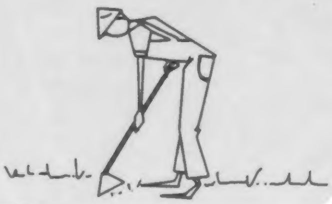


Common: ____________

Different: ____________

3

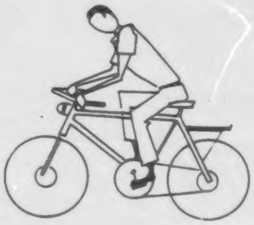


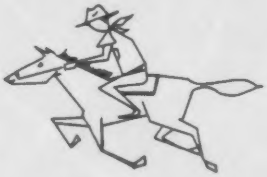


Common: ____________

Different: ____________

4





Common: ____________

Different: ____________

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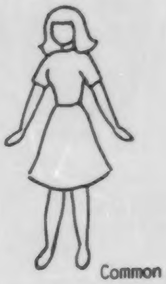
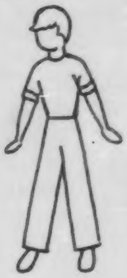
Name ________________ ________________

In one word, indicate what is common to both pictures.
Choose one word to describe the difference between them.

5

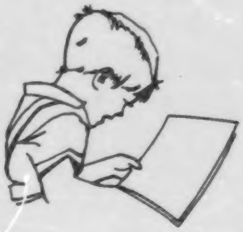


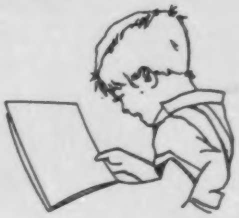


Common: ________________

Different: ________________

6

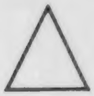


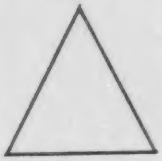


Common: ________________

Different: ________________

7

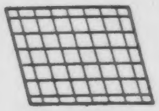


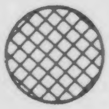


Common: ________________

Different: ________________

8





Common: ________________

Different: ________________

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Name ____________________

Name two things that have the common property listed and are different in the way specified. Be sure that you have chosen correctly.

	Common	Different	Words
Example	furniture	its use	chair cupboard
①	clothes	season	____ ____
②	tools	their use	____ ____
③	cities	their country	____ ____
④	vehicles	their speed	____ ____

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Name ______________________________________

Name two things that have the common property listed and are different in the way specified. Be sure that you have chosen correctly.

	Common	Different	Words
⑤	geographical features	their height	____ ____
⑥	buildings	their occupants	____ ____
⑦	buildings	their size	____ ____
⑧	mail	its weight	____ ____
⑨	lights	their strength	____ ____

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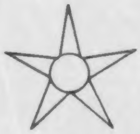
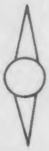
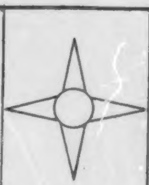
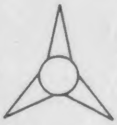
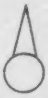
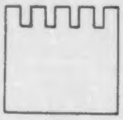
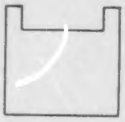
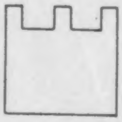
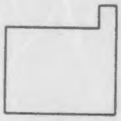
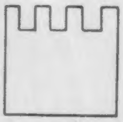
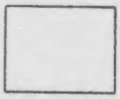
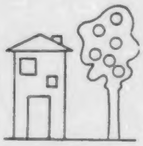
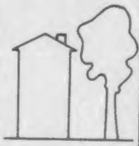
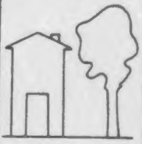
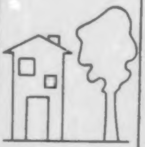
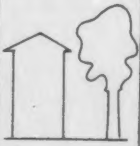
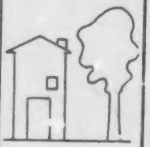
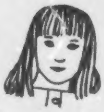
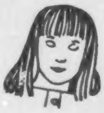
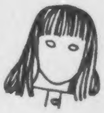
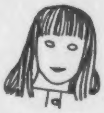
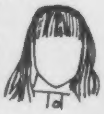
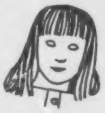
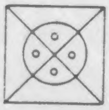
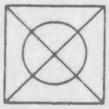
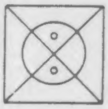
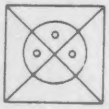
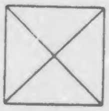
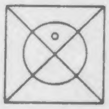
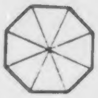
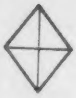
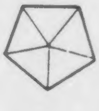
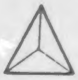
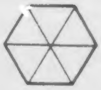
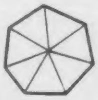
Cor
2

Name ____

Rank the five pictures in each row according to how closely they resemble the sample. The one which is most similar to the sample will be number 1, and the one which is least like it will be number 5. Put the appropriate number on the line beneath each picture.

No.	Sample	A	B	C	D	E
1		 ___	 ___	 ___	 ___	 ___
2		 ___	 ___	 ___	 ___	 ___
3		 ___	 ___	 ___	 ___	 ___
4		 ___	 ___	 ___	 ___	 ___
5		 ___	 ___	 ___	 ___	 ___
6		 ___	 ___	 ___	 ___	 ___

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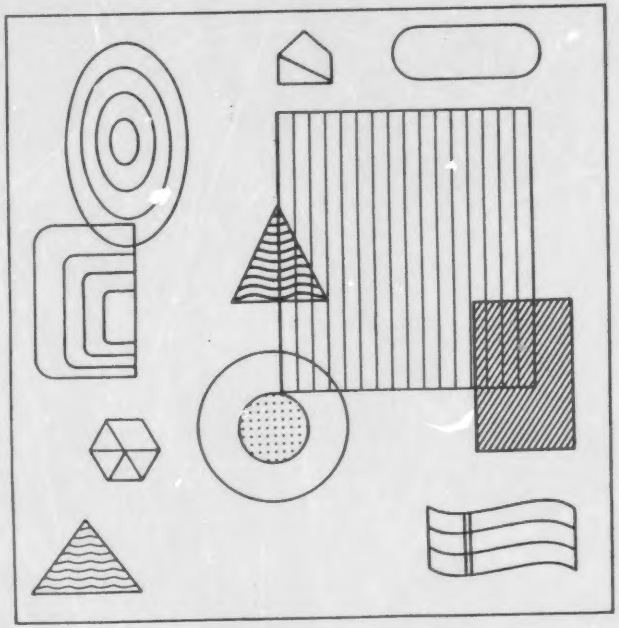

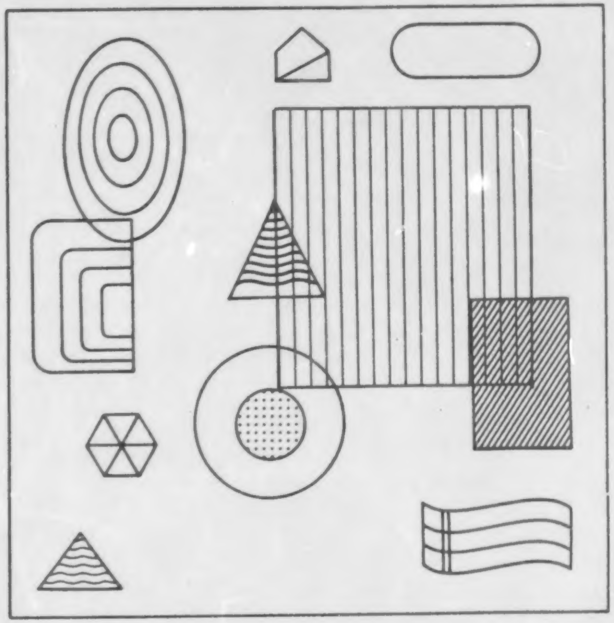

There are five differences between the two pictures. Mark each difference you find with an X.

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COMP 22

459

460

ANNEX B

VOLUNTEER-MADE MATERIALS

VOLUNTEER-MADE MATERIALS

(GROUP A)

th	sh	ch	ng	ch	th	sh
ch	ng	th	wh	sh	wh	ch
ng	wh	sh	ng	ch	ng	th
th	ch	th	sh	th	sh	ch
wh	sh	ng	th	wh	sh	ng

Illustrations

Negative Aspects:

Characters not consistently drawn
Not relevant to the text

Positive Aspects:

Used Nationals and African Buildings
Nice to look at
Community was depicted well

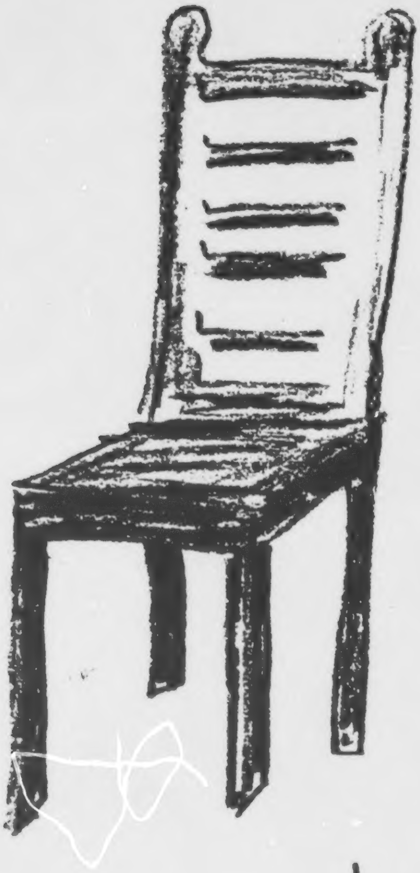
(Two consecutive consonants which represent one sound)

Blends - A combination of 2 or 3 consecutive consonants each with a distinct sound when pronounced (in one syllable).
bl, cl, fl, gl, pl, sl, spl, br, cr dr, fr, gr,
pr, tr, thr, sc, sk, sl, sm, sn, sp, st, sw
scr, spr, squ, str

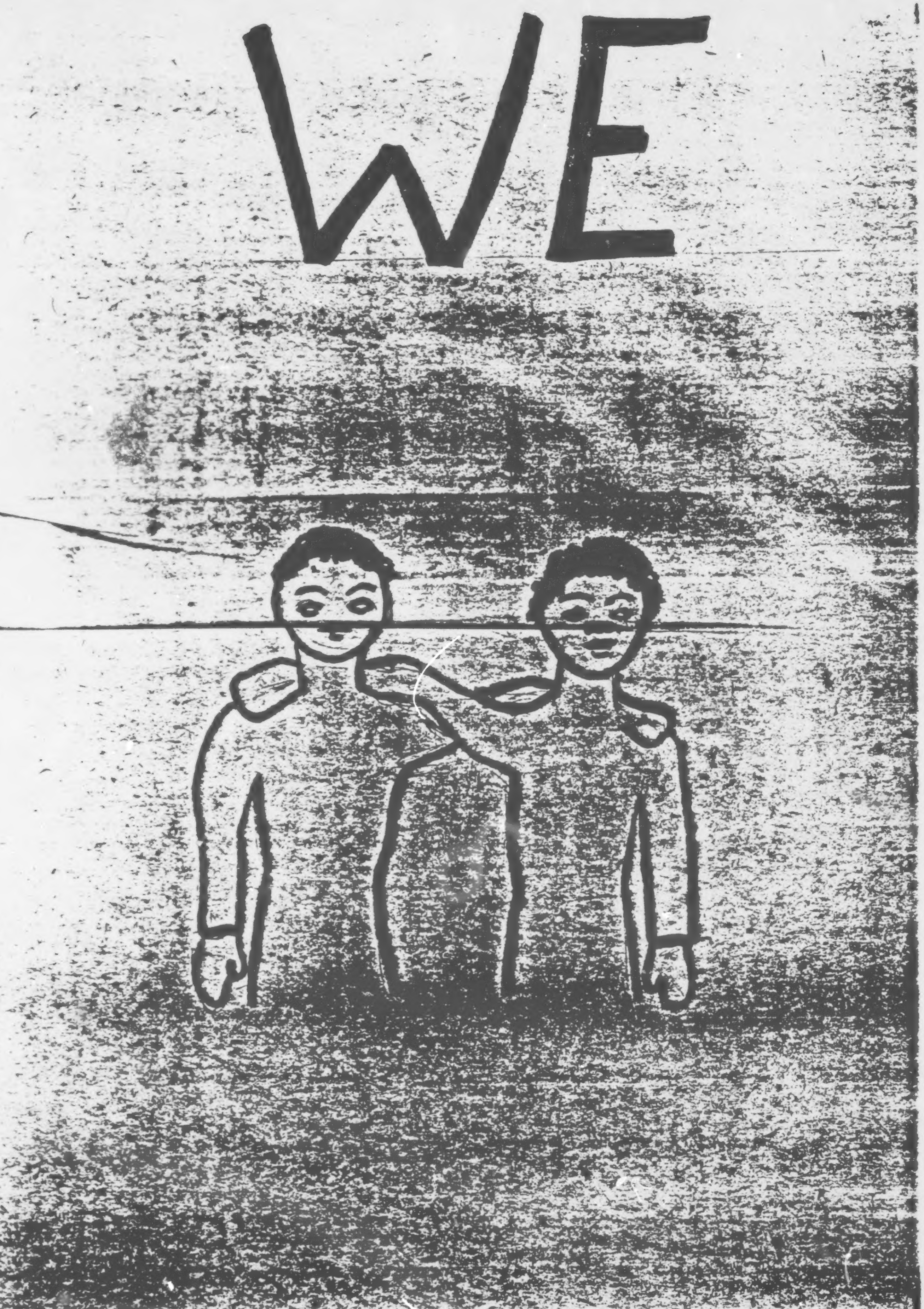
Digraphs - Vowel digraphs 2 vowels appearing together which represent one sound. ee, ei, oe, ie, ea, ai, oa, ay, ou
(Keywords - meet, ceiling, toe, pie, easy, rain, boat, play, grow)

Dipthongs - Combinations of 2 vowel sounds within one syllable, receiving one stress. oi, oy, ow, ou
(Keywords - oil, boy, cow, out)

	Regular	Digraphs
	wh	white
L a final letter	ch	chair
S as beginning consonant	th	this
R as final	sh	shoe
	ng	sing



chair



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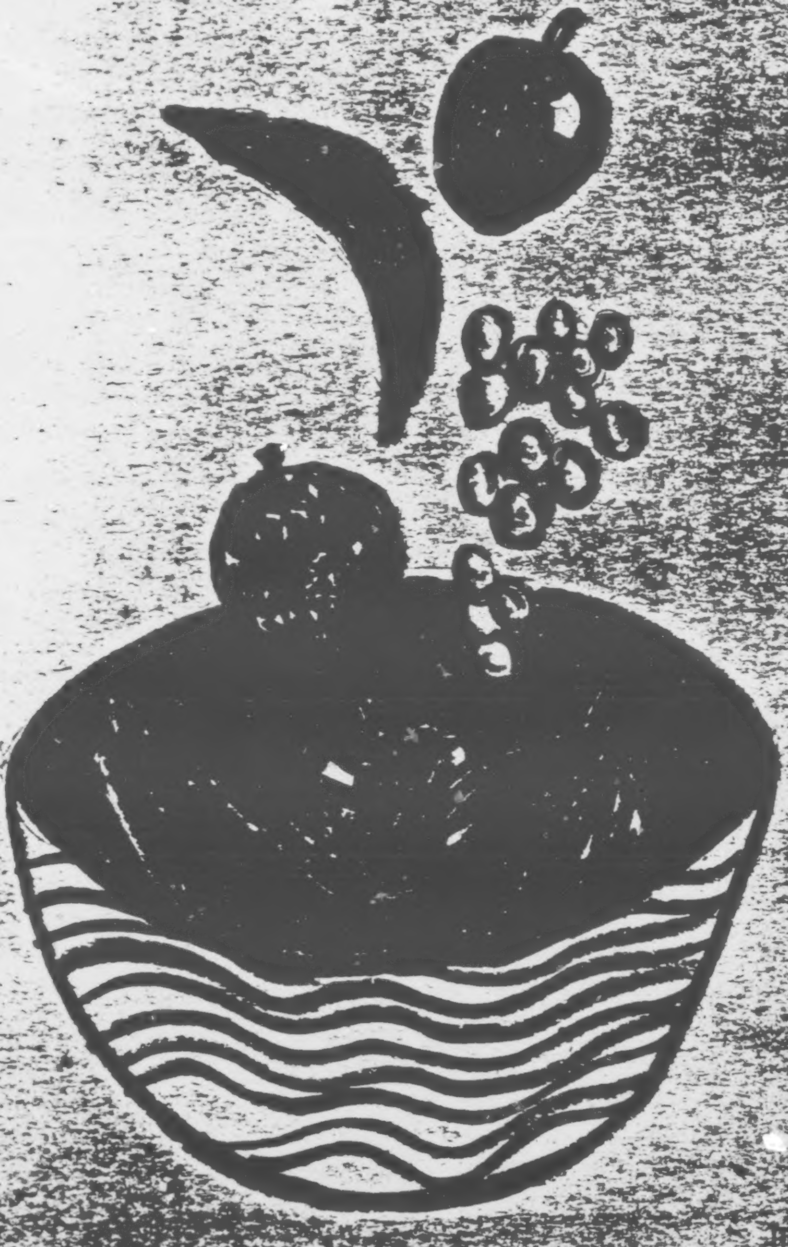

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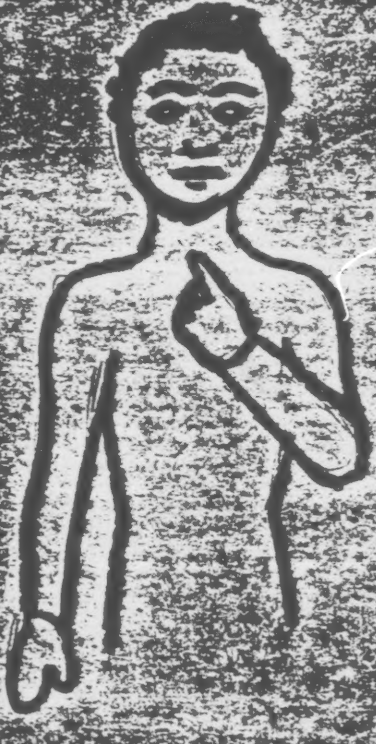

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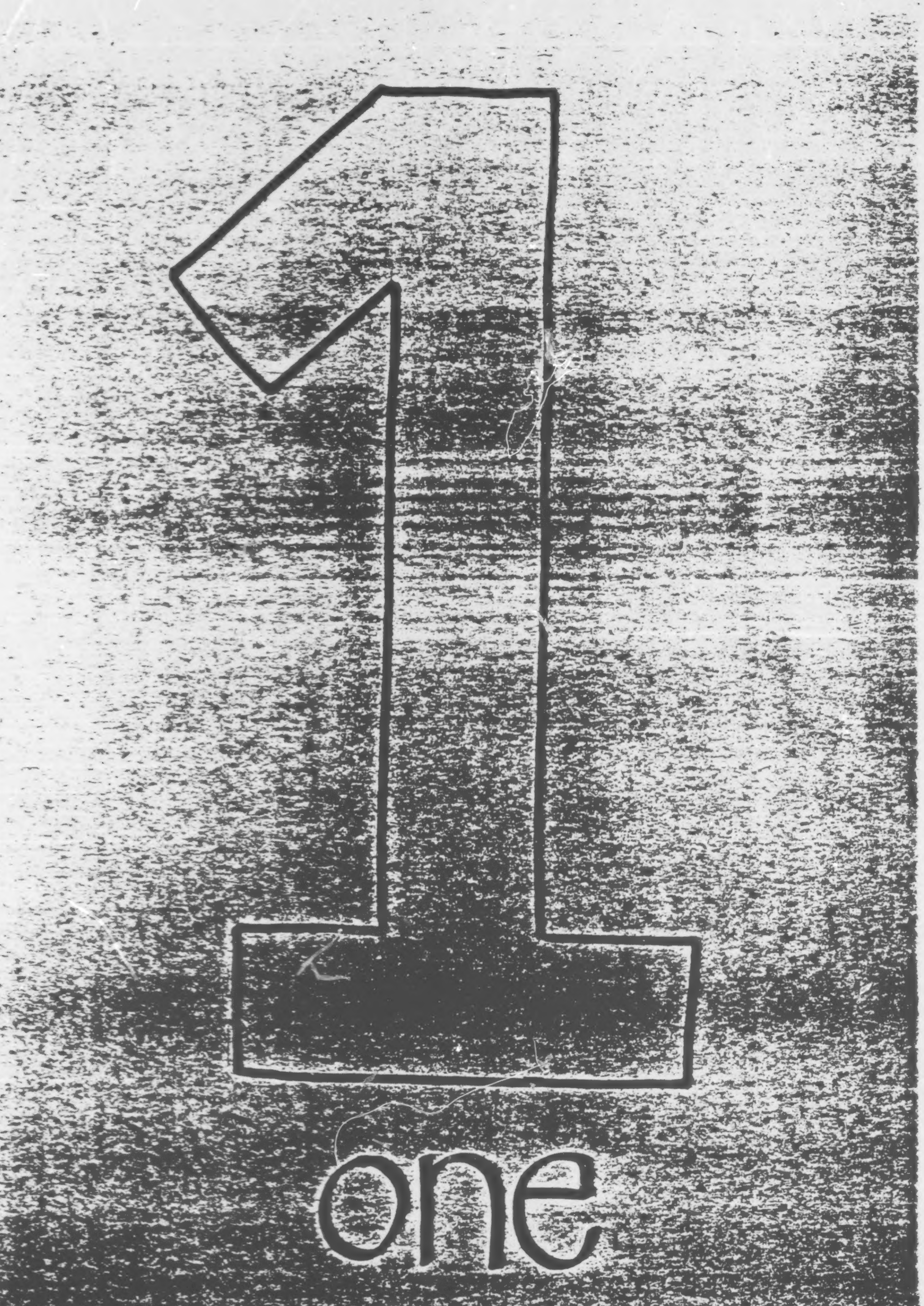

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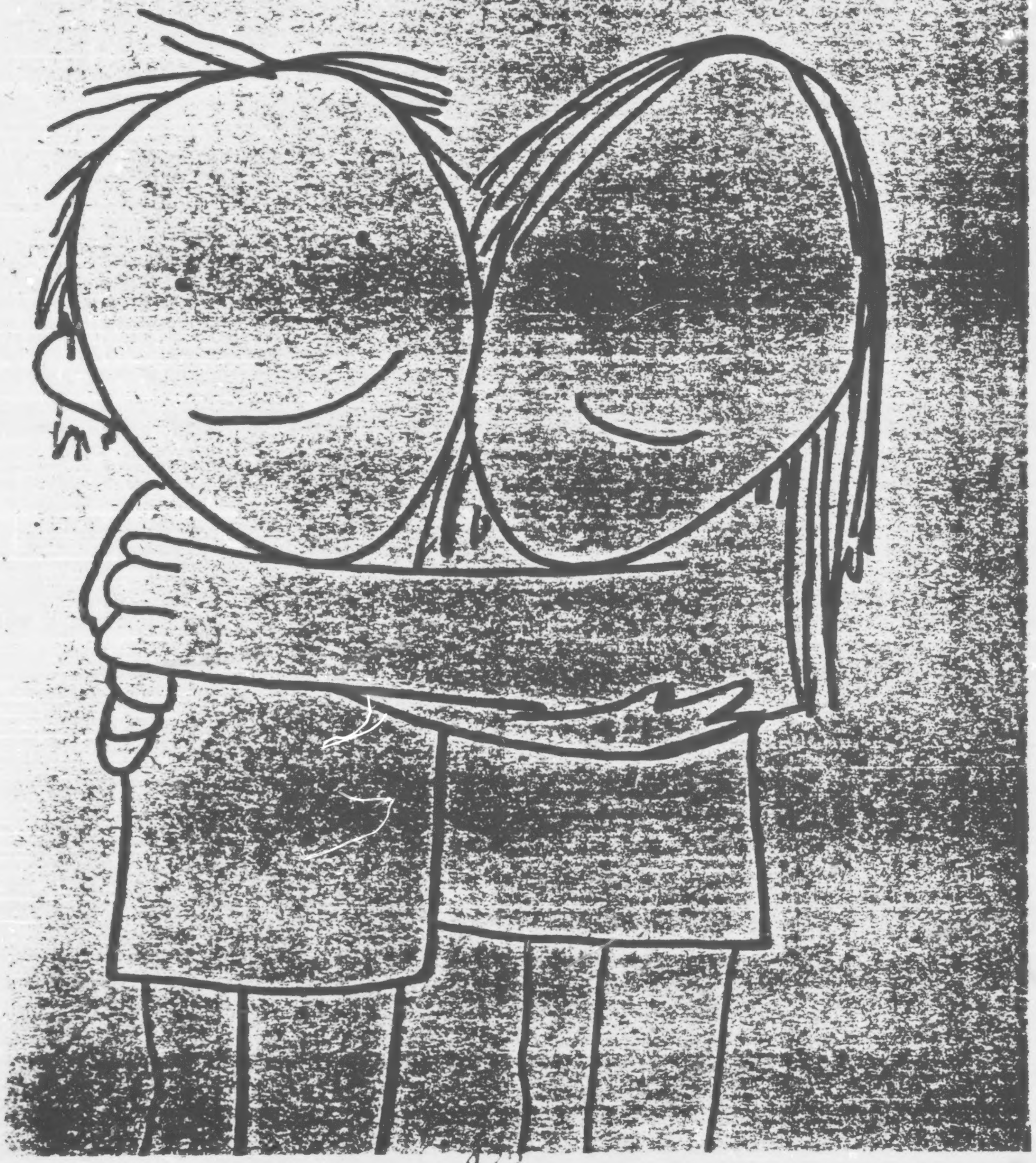

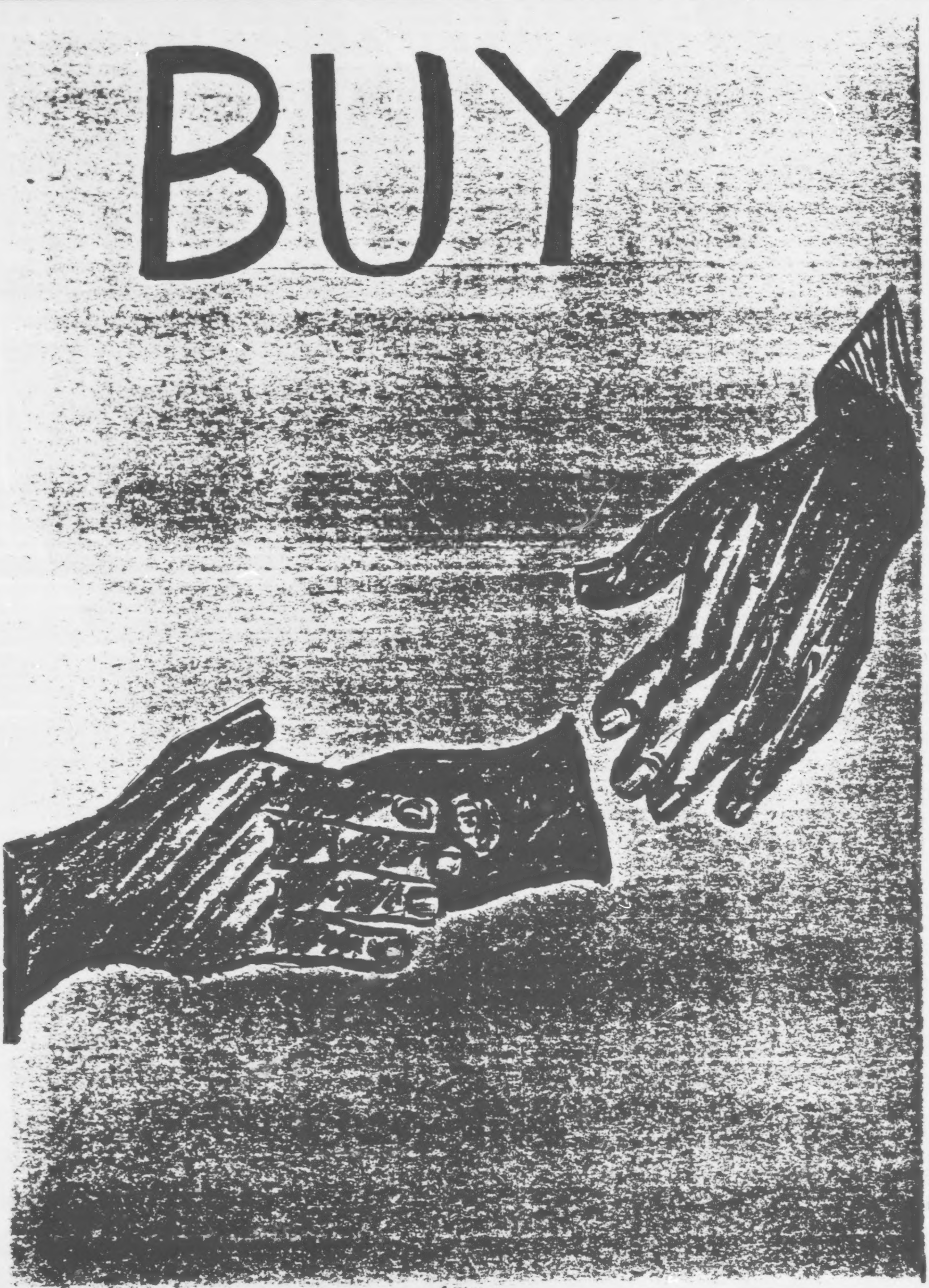

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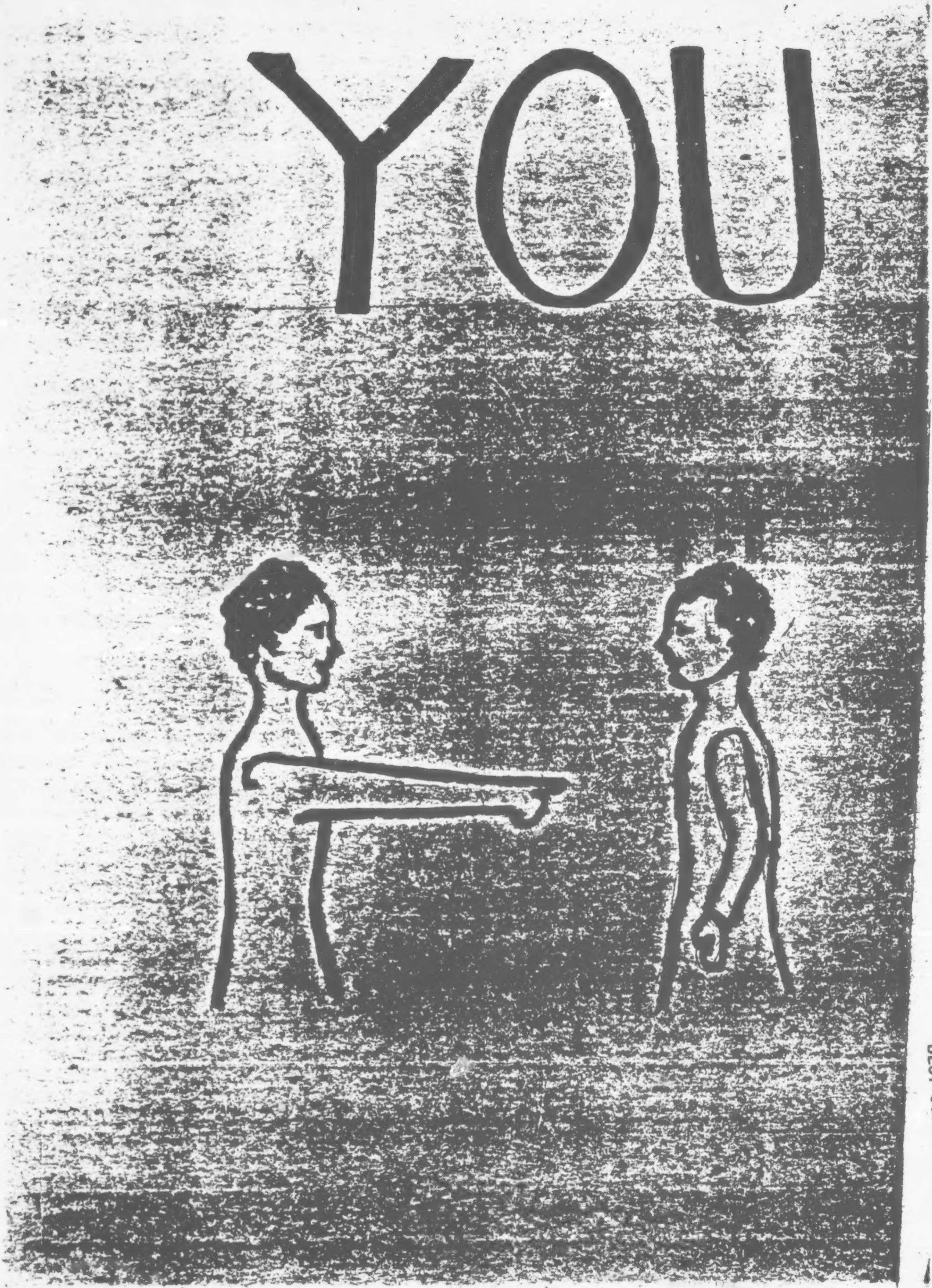

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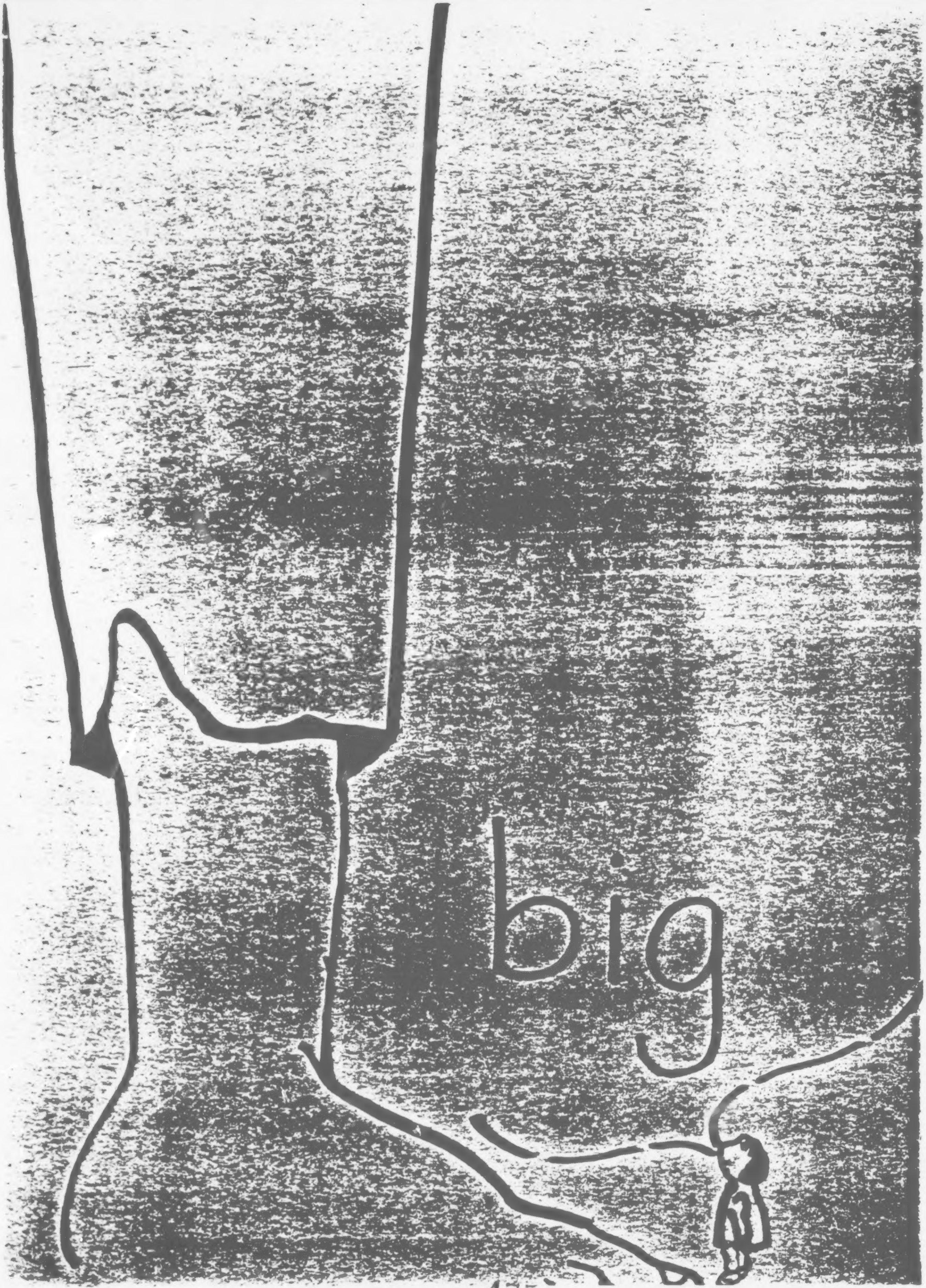

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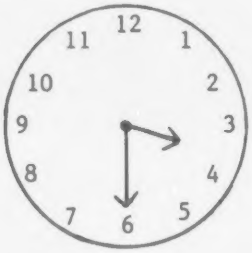
ENGLISH DIAGNOSTIC TEST - Section on General Comprehension

Circle one(1) correct answer for each question.

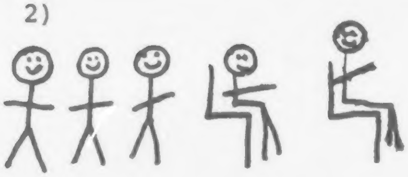
1)



What time is it?

a) It is five o'clock.
b) Is it morning?
c) It is three-thirty.
d) The city bus.

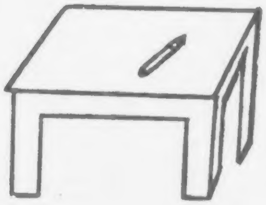
2)



How many people are standing?

a) Two people.
b) Three people.
c) All the people are standing.
d) One person.

3)



Where is the pencil?

a) The pencil is under the table.
b) The table is on the pencil.
c) The pencil is next to the table.
d) The pencil is on the table.

4) In this sentence: "The blue ball rolled against the building." How many words begin with the letter "b?"

a) Three.
b) One.
c) Four.
d) None.

5) Where is Liberia?

- a) Liberia is a country.
- b) Liberia is in Africa.
- c) We live in Liberia.
- d) Africa is a continent.

6) Which of these sentences uses incorrect English?

- a) The ocean is dangerous.
- b) The sky are blue.
- c) The people are happy.
- d) We went to Monrovia.

7) What would Abdul buy if he were rich?

- a) Abdul bought an automobile.
- b) Abdul would talk to his friend.
- c) Abdul isn't rich.
- d) Abdul would purchase a motorcycle.

8) Of the four verbs "exit, depart, return, leave," which does not belong in the group?

- a) exit
- b) depart
- c) return
- d) leave

9) Which words would you expect to find in a book about chemistry?

a) compass, ruler, binoculars

b) spinach, salt, water, meat

c) thermometer, test-tube, scales, hydrogen

d) telescope, planet, constellation, asteroid

10) Which word is a noun?

a) shining

b) truth

c) long

d) slowly

11) Which word does not belong in the group?

a) January

b) Wednesday

c) April

d) December

12) What did Abdulla buy at the market?

a) Abdulla wants to buy a new dress.

b) Abdulla saw her friend at the market.

c) Abdulla bought fruit at the market.

d) Abdulla went to the market on Friday.

Directions: In 200 words, develop a descriptive passage based upon this opening sentence: "Three hungry strangers came into the village for food."

Read the following and decide the correct answer.

1) Shakespeare was best known as a

   a) poet and playwright

   b) politician

   c) novelist

   d) soldier

2) "Gulliver's Travels" was written by

   a) William Shakespeare

   b) Mark Twain

   c) Jonathan Swift

   d) John Donne

3) "The evil that men do lives after them; the good is oft interred with their bones" is a quotation from

   a) Julius Caesar

   b) Alice in Wonderland

   c) The Prince and the Pauper

   d) Lord Jim

4) What 19th century novel portrayed the plight of the American slave?

   a) Letters from Earth

   b) Uncle Tom's Cabin

   c) War and Peace

   d) The Red Badge of Courage

5) A poem of 14 lines with a defined rhyming scheme is a

   a) ballad

   b) limerick

   c) sonnet

   d) novel

SPELLING

From the list below, check (✓) the misspelled words.

1. a. recieve
   b. believe
   c. relieve
   d. piece
   e. niece

2. a. there
   b. their
   c. they're
   d. fair
   e. ther

3. a. huor
   b. our
   c. are
   d. or
   e. minute

4. a. freind
   b. foul
   c. fold
   d. four
   e. for

5. a. eight
   b. twelve
   c. fourty
   d. one
   e. ten

VOCABULARY

Underline the word which completes each sentence most correctly.

1. The brother of my father is my (sister, uncle, nephew).
2. To keep dry during the rainy season, we use (rice, knives, umbrellas).
3. Monrovia is the (boat, capital, village) of Liberia.

4. A (hoe, fishing pole, cigarette) can be used to cultivate a garden.

5. The Atlantic (ocean, river, lake) borders Liberia on the south.

Write each of the following words in a sentence.

1. their ______________________________
2. hour ______________________________
3. I'll ______________________________
4. forget ______________________________
5. finally______________________________

Write correctly the words you will hear.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

PUNCTUATION

A) Choose the correct punctuation in the following sentences:

1. The book is on the table (.) (?)
2. Where is Tom (.) (!) (?)
3. At the market I saw chickens (.) (,) bananas (.) (,) foo foo (.) (,) and palm wine (?) (!) (.)
4. The teacher (.) (,) Mrs (.) (,) Smith (.) (,) asked, (") (') What's today's date (?) (.) / (") (')

B) Write a short paragraph using each of the following punctuation marks at least once.

period (.)
question mark (?)
comma (,)
quotation marks (" ")

C) Oral dictation.

PUNCTUATION TEST

Oral dictation - Yesterday, I met John, Dave, and Sue walking down Broad Street. John asked, "Where is Mr. Smith?" "I don't know," I answered, "but, if I know Mr. Smith, he's gone for a swim."

HEALTH TEST

1. What is disease? Name 3.

2.

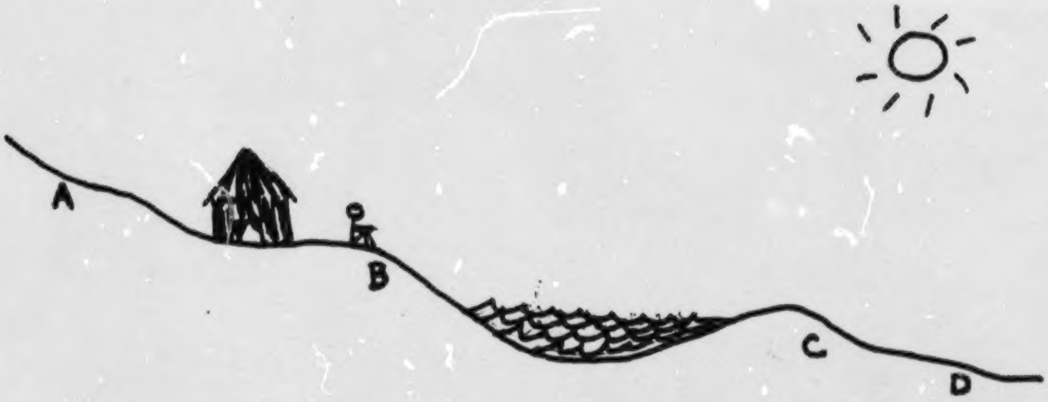
Disease	Causative Agent	Transmission or Vector (Carrier)
Malaria		
Leprosy		
TB		
Hookworm		
Hepatitis		
Dysentery		

3. What measures can we take to prevent disease? Name 5.

4. List the natural defenses of the body against disease.

5. Suggest ways in which disease carriers can be controlled in order to reduce the number of diseases.

6.



Here is a man sitting outside his house thinking about where to build the outhouse. Should it go at either points A or B uphill from his drinking water or at either C or D below the water supply?

A B C D

7. Give the names of two people that have been important in the discovery of micro-organisms and prevention of disease.

8. How can a pool of standing water be a hazard to our health? Name two ways.

9. Where is the nearest health center for our community?

10. What services are available for us at our community health center?

Name ______________________________

Date ______________________________

MATH C-II - Algebra Test 7

I. Indicate which of the following are terms. 10 points

	YES	NO
a) 2		
b) $5x^2$		
c) $\frac{3}{x}$		
d) $10x + 1$		
e) $3xyz$		

II. In each of the following algebraic expressions, identify the variable, coefficients, and constant(s). 30 points

	Expression	Variable	Coefficient	Constant(s)
a)	$3y + 5 = 10$			
b)	$9z + 5 = 0$			
c)	$8x = 16$			
d)	$7y$			
e)	$x + 12$			

III. Solve the following equations for the variable and check each answer (show all work). 60 points

a) $10x + 11 = 31$

b) $2y + 5 = 15$

c) $5 + 4z = 21$

d) $84 = 12x + 24$

e) $10 + 10x = 10$

f) $9x + 18 = 27$

GENERAL SCIENCE

A) State whether solid, liquid, or gas in the blank provided.

1. air ____________
2. rain ____________
3. rocks ____________
4. smoke ____________
5. oil ____________
6. ice ____________

B) Circle T if true, F if false

T F Observation is the first step in the scientific process.

T F A hypothesis is a statement which has been proven to be true.

T F Biology is the study of living processes.

T F If the mercury moves up in a thermometer, the temperature decreases.

T F A centimeter is an organism.

C) Multiple Choice: Circle the letter which best supports the given statement.

1 Rain falls due to the force of

a) the moon b) stars c) temperature d) gravity

2. Water initially at 70°F will freeze if

a) increases to 100°F b) decreases below 30°F
c) remains the same

3. How many centimeters in a meter?

a) 1000 b) 100 c) 10 d) 1

4. Which of the following has the greatest mass?

a) a grain of sand b) a book c) a chicken d) a car

D) State whether the following statements are a hypothesis, fact, or theory.

The sun is a star. ____________

Dinosaurs became extinct due to a dust cloud caused by a meteor striking the earth. ____________

This test is so easy that everyone will get a 100%. ____________

Man and monkeys evolved from a common ancestor. ____________

Hydrogen may be extracted from water. ____________

Extra Credit

1. Which has more mass, a gram of feathers or a gram of clay?

2. Which is more dense, oil or water?

TRUE AND FALSE

1. The atmosphere is primarily composed of oxygen. T F

2. Charles Darwin is most often associated with evolution. T F

3. The moon is one of the nine planets. T F

4. Crayfish belong to the Kingdom Arthropod. T F

5. Chlorophyll is a pigment in plants which makes them appear green. T F

6. Hair, homeothermy, placenta and mammary glands are characteristics of true mammals. T F

7. The basic components of carbohydrates are carbon, hydrogen and oxygen. T F

MULTIPLE CHOICE

1. Which is not an organ in the human body?

   a) liver b) kidney c) gizzard d) stomach

2. Which is not necessary for flowers to be complete?

   a) leaf b) sepal c) petal d) stamen

3. Which 3 structures are found in DNA?

   a) bases b) phosphate/backbone c) sugar d) fatty acid

4. Which is an amino acid?

   a) glycerin b) tryptophan c) ethanol

5. What are the byproducts of photosynthesis?

a) O_2 b) H_2O c) H_2SO_4 d) $CaCl_2$

6. At what temperature does water boil (at standard pressure)?

a) 0°C b) 32°C c) 100°C d) 212°C

7. Water is boiling on a fire for five minutes, what is the temperature?

a) 0°C b) 32°C c) 100°C d) 212°C

8. What physical phases are present when water is boiling?

a) gas b) three c) solid d) liquid

9. Which is longest?

a) 1 millimeter b) 1 inch c) 1 centimeter d) 1 foot

10. Which is the correct defining equation for force?

a) $F=ma$ b) $F=mv$ c) $F=mc^2$ d) $F=dw$

11. Bob is 60 inches tall. How many centimeters is he?

a) 120cm b) 250 cm c) 10 cm d) 152.4 cm

12. Which of the following shows the proper sequence of embryonic development?

a) embryo, prenatal, neonatal, fetus, gamitis

b) gamitis, embryo, prenatal, fetus, neonatal

c) gamitis, embryo, fetus, prenatal, neonatal

d) gamitis, fetus, embryo, prenatal, neonatal

13. Which of the following are cell processes?

a) respiration b) digestion c) evolution d) reproduction

ESSAY

1. List four(4) differences between fish and mammals.

2. What are the three states of matter?

3. Give two(2) examples of how gravity works to our benefit?

MATCHING

Match items in Column I with items in Column II

I	II
a) sand	a) gas
b) air	b) theory
c) oil	c) living
d) animal	d) particle
e) evolution	e) airplane
	f) liquid
	g) fact